

Noteworthy Records of Birds from the Panua Nature Reserve, North Sulawesi

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Summary Panua Nature Reserve is the second largest terrestrial conservation area in North Sulawesi, located on the south coast of Sulawesi's north peninsula. We conducted surveys of the reserve between February and June 2000, including 241 km of line transect censuses, primarily in the dominant lowland evergreen rainforest. A total of 124 bird species were recorded, including 48 Sulawesi endemics, and 13 species (all but two endemic) that are considered by most authorities as Threatened or Near Threatened. In this paper we describe the habitats of the reserve and summarize observations of all 13 threatened species, as well as six other species for which our surveys clarify distribution or status within Sulawesi.

Laporan-laporan Penting Mengenai Burung di Cagar Alam Panua, Sulawesi

Ringkasan Cagar Alam Panua adalah kawasan konservasi terestrial (daratan) kedua terbesar di Sulawesi Utara yang terletak di pesisir selatan semenanjung utara Sulawesi. Kami melaksanakan survey di kawasan tersebut antara Februari dan Juni tahun 2000, termasuk sensus dengan transek garis sepanjang 241 km, khususnya di hutan hujan dataran rendah. Sejumlah 124 spesies burung dilaporkan dari kawasan ini termasuk 48 spesies endemik Sulawesi dan 13 (semua kecuali 2 spesies endemik) dipertimbangkan sebagai Terancam Punah dan Mendekati Terancam Punah oleh kebanyakan pihak otoritas. Dalam makalah ini kami menjelaskan habitat-habitat yang ada di kawasan tersebut, meringkas hasil-hasil pengamatan 13 jenis Terancam Punah, dan juga 6 spesies lain yang distribusi atau statusnya di Sulawesi berhasil diperjelas dengan hasil-hasil survey kami.

Introduction

Sulawesi is the largest island in Wallacea, the biogeographical transition zone between the continental faunas of Asia and Australia. Sulawesi is one of the most important Endemic Bird Areas in Indonesia, due to its high levels of avian endemism (White & Bruce 1986; Coates & Bishop 1997; Stattersfield *et al.* 1998). The province of North Sulawesi is particularly important because it supports the highest level of endemism within Sulawesi. Thirteen species are endemic to the north and, to date, 89 of the 103 (86%) species endemic to Sulawesi and its offshore islands have been reported from this region (FAO 1982; Lee 2001). In addition 36 species found in North Sulawesi are listed as Threatened or Near Threatened (BirdLife International 2001; Lee *et al.* 2001).

Located on the south coast of Sulawesi's north peninsula, Panua Nature Reserve (0°42'N, 122°00'S) was established in 1938 for the Mount Panua proper (Uno 1949; FAO 1982) and later extended to its present 45,557 ha. This reserve was established primarily to protect nesting grounds of Sulawesi's endemic and threatened megapode, the Maleo *Macrocephalon maleo* (FAO 1982; KSDA 1998). The significance of Panua Nature Reserve (NR) for the conservation of North Sulawesi's flora and fauna was subsequently realised when J. MacKinnon surveyed the area during the late 1970s (FAO 1982). Argeloo (1994) surveyed the Maleo nesting grounds in Panua NR, but did not publish records of any other species observed within the reserve. Thus the following represents the first known published account of birds for this important reserve.

The current boundary of the reserve encompasses three main watersheds: to the east, the low-lying Bumbulan flood plain and associated Bumbulan River; in the centre, the Marisa plains and drainage system; and to the west, the Randangan system of the Buhu, Randangan and Lelenggela Rivers. Large sections of these areas have now been converted to rice cultivation. In the northern parts of the reserve, away from low-lying coastal areas and the narrow alluvial plains, Panua is rugged and mountainous with steeply sided narrow valleys. A series of mountain ridges include the virtually unexplored peaks of Mounts Botubantayo (1,405 m asl), Batudulanga (1,300 m asl), Langge (1,076 m asl), and Padasepayo (1,625 m asl) (KSDA 1998).

Our surveys showed that lowland evergreen rainforest is the dominant habitat in the reserve up to c. 1,000 m asl. Typically in this habitat the forest canopy forms at c. 17-25 m, with few emergent trees. Characteristic small to medium girthed tree species include *Barringtonia acutangula*, *Polyalthia* spp, *Diospyros korthalsiana*, *Cananga odorata*, and *Mallotus floribundus*. Common medium to large (30-50 cm diameter at breast height = DBH) species are *Pterospermum celebicum*, *Tetrameles nudiflora*, *Neonauclea* sp, *Drypetes* spp, and *Maranthes corymbosa*. Amongst the few large trees (> 50 cm DBH) are *Koordersiodendron pinnatum*, *Pometia pinnata*, and *Canarium* spp. Palms including *Arenga pinnata*, *Livistona rotundifolia* and *Caryota mitis* occur frequently in the dense understorey, which also contains many rattans *Calamus* spp and climbers. Hill or lower montane forest is found above c. 1,000 m asl, but no detailed studies of this habitat were conducted.

Habitat disturbance caused by human activities, primarily selective logging, has created a patchwork of secondary growth and regenerating secondary forest surrounded by primary forest. Such disturbed areas were characterized by pioneer species including *Trema orientalis*, *Macaranga hispida*, *Piper aduncum* and *Dendrocnide microstigma*. In secondary forest along the coastal strip common tree species were *Melanolepis multiglandulosa*, *Albizia saponaria*, *A. minahassae*, *Grewia koordesiana*, *Garuga floribunda*, *Diospyros minahassae*, *Terminalia celebica*, and *Alstonia ranvolfia*. Forest structure is open with few tall trees and a sparse, broken canopy. Mangrove vegetation in the reserve appeared to be made up of species typical of the Sulawesi region. Although detailed surveys were not conducted, tree genera noted included *Rhizophora*, *Sonneratia*, *Bruguiera* and *Avicennia*.

This paper documents observations of birds made during a Wildlife Conservation Society survey of the reserve between February and June 2000. In February, March and May 2000, surveys were conducted in the southern section of the reserve close to the village of Paguat (0°27'N, 122°00'E) and along the Trans-Sulawesi highway. Habitats surveyed included gardens and plantations bordering the village, dry coastal scrub and secondary forest to the north-west and areas of mangrove and swamp vegetation to the south. We also visited secondary and primary forest on the narrow Batudulanga ridge, disturbed habitats along the Batudulanga River, and heavily logged forest within recently established agricultural land around Mount Pani (c. 787 m asl).

In May and June 2000 we made observations in primary and selectively logged forests north-east of the village of Kalimas. Our camp (0°40'N, 121°54'E) was situated on the western border of the reserve at an altitude of 100 m on the banks of the Lelenggela River. Transects extended inland from selectively logged riverine forest to less disturbed ridge forests up to 620 m asl on the northwestern slopes of Mount Rabana (c. 875 m asl).

In June 2000 we surveyed primary forest some 5 km north of Butato. Our camp (0°37'N, 122°03'E) was located in primary forest at c. 125 m asl on the northern slopes of

Mount Langge. Surveys were conducted in gently undulating terrain to the west of the camp, and on the southern slopes of Mount Rabana.

Most of the information presented in this paper was collected during daily surveys from 0530 to 1030 hrs along a total of 241 km of line transects, comprising 152 km over 17 survey days at Kalimas and 89 km over 10 survey days at Butato. Additional casual observations were made around campsites and from three days of mist netting carried out in May at Kalimas.

We recorded 124 bird species in the reserve (Appendix 1), of which 48 are Sulawesi endemics, and 13 (all but two endemic) are considered Threatened, Near Threatened or Vulnerable by Coates & Bishop (1997), IUCN (2000) and/or BirdLife International (2001). The following section summarizes our observations of the latter species, and six additional species for which our surveys clarify distribution or status within Sulawesi.

Notes on selected species:

Oriental Darter *Anhinga melanogaster* NT

On 2 March two birds were observed flying west over the Paguat mangroves. This is a Near Threatened species that is widespread but uncommon on Sulawesi (Coates & Bishop 1997; IUCN 2000; BirdLife International 2001).

Bat Hawk *Macheiramphus alcinus*

On 6 May at 1745 hrs a single bird was seen taking small bats, probably *Saccolaimas saccolaimas*, that were emerging from a roost in mangroves to the west of Paguat. The hawk caught a bat in mid-air using its talons and was observed, in silhouette, for 10 min eating its prey whilst perched in a dead mangrove tree. The bird was identified as *M. alcinus* on the basis of its all-black coloration except for a white throat patch, long wings and short tail. This species is rare in Sulawesi, being known from two sight records in central Sulawesi only (Klapste 1982; White & Bruce 1986; Coates & Bishop 1997; Thiolay & Rahman 2002).

Peregrine Falcon *Falco peregrinus*

On 8 May a single bird was observed perched in a large, dead tree at the forest edge close to Kalimas. This individual was identified as a member of the resident race *F. p. ernesti* by the dense barring on its underparts and dark grey-black upperparts. This race is thought to breed on Sulawesi but is uncommon and sparsely distributed (White & Bruce 1986; Coates & Bishop 1997).

Maleo *Macrocephalon maleo* E, Endangered

Panua NR is named after the local (Gorontalo) indigenous name for this megapode (Uno 1949). There are two main nesting grounds in the reserve, both coastal sites near the village of Paguat (Wiriosopartha 1980). A harvest of c. 10,000 eggs from a 2 ha coastal strip was reported for 1947 (Uno 1949). Wiriosopartha (1980) estimated the total number of breeding hens at 25-67% of the total in the 1940s. Argeloo (1994) noted 490 burrows and a minimum of 125 pairs using the sites annually between 1985-1991.

We visited the nesting grounds over six days in March and May 2000, months falling within the species' reputed breeding season in north Sulawesi (Argeloo 1994). The nesting grounds were monitored from dawn until late afternoon by teams of observers sitting motionless in a number of locations, but no Maleos were recorded. The sole record was of a lone bird in scrubby coastal forest close to the Trans-Sulawesi highway at Paguat on 30 April. Interviews with local people at Paguat in May suggest that small numbers of Maleo

still use both nesting grounds. However, the population is endangered by a number of serious threats including the loss of forest habitat adjacent to nesting grounds, egg collection, and habitat fragmentation. Unless protection measures are increased it seems inevitable that these nesting grounds, once supporting the largest known population in Sulawesi (Argelloo 1994), will be abandoned in the future.

Beach Thick-knee *Esacus magnirostris* NT

Two birds, presumably a pair, were observed on mud flats at the Paguat mangroves on several days between 27 February and 7 May. This is a sparsely distributed and uncommon species on Sulawesi that is classified as globally Near Threatened (Coates & Bishop 1997; IUCN 2000; BirdLife International 2001).

Maroon-chinned Fruit-dove *Ptilinopus subgularis* E, NT

Recorded only in primary, secondary and disturbed forests at 90–225 m asl at Kalimas between 12 and 30 May. There were a total of 15 sight records of 1–3 birds during transect surveys, with birds also regularly heard along both transects and around the camp.

Pied Imperial Pigeon *Ducula bicolor*

Flocks of between 15 and 25 birds were observed flying over the Paguat mangroves throughout the survey period, with the majority of birds noted in the early morning leaving roosts in mangroves and moving inland. A maximum of c. 600 birds, including one flock of c. 120 birds, was noted on 6 May. Identified from White Imperial Pigeon *D. luctuosa* (not recorded for the reserve) by the all jet black primaries and secondaries, white tertials, and cream white head and underparts. On mainland Sulawesi *D. bicolor* is a sparsely and locally distributed species (Coates & Bishop 1997).

Yellow-breasted Racquet-tail *Prioniturus flavicans* E (N), NT

This north peninsula endemic parrot is considered Near Threatened (White & Bruce 1986; Coates & Bishop 1997; IUCN 2000; BirdLife International 2001). It occurs at estimated densities of 16 birds km² in Bogani Nani Wartabone National Park (to the east of Panua NR), and may have specialized nesting requirements (Walker & Cahill 2000; Walker & Seroji 2000). At Panua NR we sighted a single bird in logged forest at Kalimas on 20 May, and have two records from primary forest at Butato in June. Although it was heard more frequently than seen, particularly at Kalimas, we consider the species rare in the reserve.

Red-billed Hanging-parrot *Loriculus exilis* E, NT

Apparently very rare in Panua NR, although possibly overlooked because of its small size and unobtrusive behaviour. We saw just one pair on 28 May at c. 190 m asl in primary forest at Kalimas.

Hodgson's Hawk-cuckoo *Cuculus fugax*

A rare visitor to Sulawesi during the northern winter with records in January and March (Coates & Bishop 1997). One immature bird was found with its legs entangled amongst vines in secondary scrub along the Batudulanga River on 5 March. King (2002) proposes splitting the four forms of *C. fugax* into four species. If this proposal is accepted the individual we recorded should be assigned to the migratory Northern Hawk-cuckoo *Hierococcyx (Cuculus) hyperythrus*.

Ochre-bellied Boobook *Ninox ochracea* E, NT

Most records were obtained in heavily disturbed riverine forest around the Kalimas camp, with up to six birds heard each night throughout May. A pair of boobooks was mist-netted close to the camp at 0130 hrs on 17 May.

Satanic Nightjar *Eurostopodus diabolicus* E, VU

There are few reliable records of this little-known species outside Lore Lindu National Park (BirdLife International 2001; Riley & Wardill, this volume). On 11 May we discovered a nest of this species in the centre of a dense area of rattan in selectively logged forest at c. 345 m asl, above Kalimas. Full details of this observation are provided by Riley & Wardill (2003).

Sulawesi Dwarf Kingfisher *Ceyx fallax* E, NT

This was the most commonly recorded forest kingfisher species at Panua NR. Solitary birds were seen at Kalimas and Butato with a total of 21 records, 13 of them in selectively logged forest and eight in primary forest, at altitudes of 125-555 m asl.

Lilac-cheeked Kingfisher *Cittura cyanotis* E, NT

Seen and heard regularly at both Kalimas and Butato, with a total of 18 observations during transect surveys between 15 May and 16 June. All sightings were of single birds except for two birds together on 31 May. They were noted in both primary and selectively logged forest at 100-315 m asl.

Green-backed Kingfisher *Actenoides monarchus* E, NT

Single birds of this species were recorded on four separate occasions at Kalimas only. Birds were observed in primary and selectively logged forest at c. 130-435 m asl between 12 and 23 May. We also heard a bird calling at dawn on 16 May in disturbed riverine forest close to the Kalimas campsite.

Hooded Pitta *Pitta sordida*

On Sulawesi, restricted to the north peninsula where the endemic subspecies *P. s. forsteni* is a little known inhabitant of lowland forest (Coates & Bishop 1997). On four dates between 22 and 31 May at Kalimas two birds were recorded in the same location at c. 130 m asl in selectively logged forest. The only other observation was of a single bird on 15 June at Butato in primary forest at c. 575 m asl.

Pied Cuckoo-shrike *Coracina bicolor* E, NT

Confined to lowland forests this species was frequently encountered at Panua NR in small flocks of 4-5 birds in the crowns of tall trees in secondary and selectively logged forest to c. 255 m asl.

Rufous-throated Flycatcher *Ficedula rufigula* E, NT

Occurs throughout Sulawesi in lowland forest (Coates & Bishop 1997; BirdLife International 2001). Single birds were observed on 13 dates in primary and selectively logged forest between c. 130 m and 315 m asl. A male bird was caught in a mist-net set in primary riverine forest at Kalimas, where a pair was seen feeding a single juvenile bird on 24 May.

Sulawesi Drongo *Dicrurus montanus* E

Drongos were recorded on five dates between 17 May and 11 June at Kalimas. They were noted in primary and selectively logged forest between c. 265 m and 490 m asl, lower than the altitudinal range of 550-1,800 m asl given by Coates & Bishop (1997). This species is

distinguished from the more widespread *D. hottentottus* by the dark (red) eye, slender build and long, forked tail lacking flared outer tail feathers. On one occasion *D. montanus* was observed accompanying a party of Heck's Macaques *Macaca hecki*, apparently feeding on insects disturbed by the macaques.

Discussion

The above species accounts suggest Panua NR is an important area for the conservation of Sulawesi's unique avifauna. The intact and relatively undisturbed lowland forests support populations of 11 putatively threatened endemic birds. The true conservation value of the reserve has yet to be realized. Our brief surveys have been concentrated in the southern, lowland section of the park, where 124 species of birds, 19 species of mammals, and 87 tree species have been recorded (Lee *et al.* 2000). Vast areas in the central and northern section of the reserve have yet to be surveyed, and the biodiversity of the high mountain peaks remains unexplored.

Throughout North Sulawesi, natural environments are being lost as a consequence of accelerating pressures from mining, logging and land conversion on protected areas (e.g. Lee *et al.* 2001). In Panua, however, the remoteness of many areas from human settlements, the extreme terrain, and resultant difficulty of access, have all contributed to a lessening of human impact on the forest.

Whilst the park's size has ameliorated some of the negative pressures resulting from human activities in its hinterlands, it nevertheless faces a number of serious threats, specifically gold mining, habitat degradation and hunting. Gold mining is the single most important activity impacting on the park at present. It is concentrated at three sites: Mount Pani (or rather the unnamed c. 772 m asl peak to the southwest of Mount Pani) in the southwest; Mount Langge in the southeast; and an isolated site in the northeast (reported by miners to be close to Mount Utilemba, but not visited by WCS). Most mining is illegal and is causing localized degradation of forests, poisoning of water sources by mercury, and increased levels of hunting.

Illegal hunting of wildlife is a prevalent problem. Large mammals are the hunters' primary target species, but traps were noted to have captured Sulawesi Ground-Dove *Gallioloculus tristigmata* and Red Junglefowl *Gallus gallus*.

Other pressures, significant in certain sectors of the park, include illegal rattan and timber extraction and agricultural encroachment. Until recently timber extraction appears to have been a relatively minor pressure on the park. However, logging activities in some areas along the periphery of the reserve are becoming increasingly intensive and large amounts of wood of certain tree species are being poached. At Kalimas, rafts of hardwood planks are floated down the Randangan River from at least two to four days walk (estimated to be c. 30 km inland). All forests close to major rivers in the Randangan catchment, along the Batudulanga River, and in the Bumbulan River system have been affected by this selective logging.

All of these factors have a negative effect on the habitats or wildlife contained within the reserve's boundaries and are particularly serious in the southern portion of the protected area. These problems are exacerbated by the low numbers of guards present inside the park and the current inadequate management and administrative structure. To date it appears that management of Panua NR by the government agency for Natural Resources and Conservation (KSDA) has been virtually non-existent. The reserve is subject to some of the most intensive pressures of all protected areas in the province and

yet a single field officer is responsible for routine protection of over 45,000 ha of land. Thus the reserve is little more than a 'paper park'.

Despite these problems, the reserve has significant conservation potential as its ecosystems are still relatively intact. The reserve is the second largest terrestrial conservation area in North Sulawesi (Lee *et al.* 2001) and combined with the diversity of habitats enclosed in its borders representing an ecological progression from mangroves through coastal and lowland forest to submontane forests clearly has a key role to play in future efforts to conserve the island's biodiversity.

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Appendix 1. Status, habitat and altitudinal range of birds recorded by authors in Panua Nature Reserve, North Sulawesi

Habitat: P, primary forest; S, secondary forest; L, selectively logged or disturbed primary forest; M, mangrove; K, agricultural land (kebun); R, rivers. *Status:* E, endemic to Sulawesi region; EN, Endangered; VU, Vulnerable; NT, Near Threatened, M, migrant.

Latin Name	English Name	Altitude range (m asl)	Habitats	Status
<i>Anhinga melanogaster</i>	Oriental Darter	0-40	M	NT
<i>Ardea sumatrana</i>	Great-billed Heron	0	M	
<i>Ardea purpurea</i>	Purple Heron	0-40	M,K	
<i>Casmerodius albus</i>	Great Egret	0	M	
<i>Egretta garzetta</i>	Little Egret	0-40	M,K	
<i>Bubulcus ibis</i>	Cattle Egret	0-40	M,K	
<i>Ardeola speciosa</i>	Javan Pond-heron	0-40	K	
<i>Butorides striatus</i>	Striated Heron	40	M	
<i>Plegadis falcinellus</i>	Glossy Ibis	40	K	
<i>Pandion haliaetus</i>	Osprey	0	M	
<i>Macheiramphus alcinus</i>	Bat Hawk	0	M	
<i>Haliastur indus</i>	Brahminy Kite	0-40	M,S,K	
<i>Spilornis rufipectus</i>	Sulawesi Serpent-eagle	315-465	L,P	E
<i>Circus assimilis</i>	Spotted Harrier	0	M	
<i>Accipiter griseiceps</i>	Sulawesi Goshawk	230-250	L,P	E
<i>Accipiter trinator</i>	Spot-tailed Goshawk	130-250	L	E
<i>Ictinaetus malayensis</i>	Black Eagle	0-100	S,K	
<i>Spizaetus lanceolatus</i>	Sulawesi Hawk-eagle	505-570	P	E
<i>Falco moluccensis</i>	Spotted Kestrel	40	K	
<i>Falco peregrinus</i>	Peregrine Falcon	40	K	
<i>Dendrocygna arcuata</i>	Wandering Whistling-duck	0-35	M,K,R	
<i>Anas gibberifrons</i>	Sunda Teal	0-40	M,R	
<i>Megapodius cumingii</i>	Philippine Scrubfowl	0-140	S	
<i>Macrocephalon maleo</i>	Maleo	0-35	M,S	E, EN
<i>Gallus gallus</i>	Red Junglefowl	40-590	P,L,P	
<i>Turnix suscitator</i>	Barred Button-quail	40	K	
<i>Gallirallus philippensis</i>	Buff-banded Rail	0-100	S,K	
<i>Gallirallus torquatus</i>	Barred Rail	0-100	S,K	
<i>Amaurornis isabellinus</i>	Isabelline Bush-hen	0-35	M,K,S	E
<i>Amaurornis phoenicurus</i>	White-breasted Waterhen	0-35	K	
<i>Gallinula chloropus</i>	Common Moorhen	0-35	K	
<i>Porphyrio porphyrio</i>	Purple Swampfen	0-35	K	
<i>Pluvialis fulva</i>	Pacific Golden Plover	0	M	M
<i>Numenius phaeopus</i>	Whimbrel	0	M	M

<i>Tringa totanus</i>	Common Redshank	0	M	M
<i>Tringa nebularia</i>	Common Greenshank	0	M	M
<i>Actitis hypoleucos</i>	Common Sandpiper	0-40	M,R	M
<i>Esacus magnirostris</i>	Beach Thick-knee	0	M	NT
<i>Treron griseicauda</i>	Grey-cheeked Green Pigeon	0-425	M,L,P	
<i>Treron vernans</i>	Pink-necked Green Pigeon	0	M,K	
<i>Ptilinopus subularis</i>	Maroon-chinned Fruit-dove	130-505	S,L,P	E, NT
<i>Ptilinopus superbus</i>	Superb Fruit-dove	425-570	P	
<i>Ptilinopus melanospila</i>	Black-naped Fruit-dove	0-570	S,L,P	
<i>Ducula forsteni</i>	White-bellied Imperial Pigeon	145-300L,P	E	
<i>Ducula radiata</i>	Grey-headed Imperial Pigeon	145-300	L,P	E
<i>Ducula aenea</i>	Green Imperial Pigeon	0-215	M,S,L,P	
<i>Ducula bicolor</i>	Pied Imperial Pigeon	0	M,S	
<i>Turacoena manadensis</i>	Sulawesi Black Pigeon	0-265	S,L	E
<i>Macropygia amboinensis</i>	Slender-billed Cuckoo-dove	0-460	L,P	E
<i>Streptopelia chinensis</i>	Spotted Dove	0-40	S,K	
<i>Chalcophaps indica</i>	Emerald Dove	0-410	S,L	
<i>Chalcophaps stephani</i>	Stephan's Dove	0-35	K,S	
<i>Gallicolumba tristigmata</i>	Sulawesi Ground-dove	90-515	L,P	E
<i>Trichoglossus ornatus</i>	Ornate Lorikeet	0-40	M,S,K	E
<i>Prioniturus flavicans</i>	Yellow-breasted Racquet-tail	270-310	L,P	E,NT
<i>Prioniturus platurus</i>	Golden-mantled Racquet-tail	0-465	S,L,P	E
<i>Tanygnathus sumatranus</i>	Blue-backed Parrot	0-185	M,K,S,L	
<i>Loriculus stigmatus</i>	Sulawesi Hanging-parrot	0-435	K,S,L,P	E
<i>Loriculus exilis</i>	Red-billed Hanging-parrot	90	P	E,NT
<i>Cuculus fugax</i>	Hodgson's Hawk-cuckoo	0-50	S	M
<i>Cacomantis sepulcralis</i>	Rusty-breasted Cuckoo	40-310	L	
<i>Eudynamys melanorhyncha</i>	Black-billed Koel	0-50	S	
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	0-50	K	
<i>Rhamphococcyx calyrorhynchus</i>	Yellow-billed Malkoha	0-570	S,L,P	E
<i>Centropus bengalensis</i>	Lesser Coucal	0	S,K	
<i>Centropus celebensis</i>	Bay Coucal	0-585	S,L,P	E
<i>Tyto rosenbergii</i>	Sulawesi Owl	0-240	S,M	E
<i>Otus manadensis</i>	Sulawesi Scopsowl	0-240	S,P	E
<i>Ninox ochracea</i>	Ochre-bellied Boobook	90	L	E,NT
<i>Eurostopodus diabolicus</i>	Satanic Nightjar	350	L	E,VU
<i>Eurostopodus macrotis</i>	Great Eared Nightjar	0-320	M,S,L,P	
<i>Aerodramus vanikorensis</i>	Uniform Swiftlet	0-40	K,L	
<i>Collocalia esculenta</i>	Glossy Swiftlet	0	K	
<i>Hemiprocne longipennis</i>	Grey-rumped Tree-swift	0-275	S	
<i>Alcedo atthis</i>	Common Kingfisher	0-200	M,R	
<i>Ceyx fallax</i>	Sulawesi Dwarf Kingfisher	130-460	L,P	E,NT
<i>Pelargopsis melanorhyncha</i>	Black-billed Kingfisher	30-210	R	E
<i>Cittura cyanotis</i>	Lilac-cheeked Kingfisher	80-315	S,L,P	E,NT
<i>Halcyon coromanda</i>	Ruddy Kingfisher	0-50	R, L	
<i>Halcyon chloris</i>	Collared Kingfisher	0-50	M,K	
<i>Actenoides monachus</i>	Green-backed Kingfisher	130-435	L	E,NT
<i>Actenoides princeps</i>	Scaly-breasted Kingfisher	200	P	E
<i>Merops ornatus</i>	Rainbow Bee-eater	0-50	M,S	M
<i>Meropogon forsteni</i>	Purple-bearded Bee-eater	275-585	P	E
<i>Penelopides exarhatus</i>	Sulawesi Hornbill	35-510	S,L,P	E
<i>Rhyticeros cassidix</i>	Knobbed Hornbill	80-535	S,L,P	E
<i>Mulleripicus fulvus</i>	Ashy Woodpecker	35-545	S,L,P	E
<i>Dendrocopos temminckii</i>	Sulawesi Woodpecker	215	P	E
<i>Pitta erythrogaster</i>	Red-bellied Pitta	130-300	L,P	
<i>Pitta sordida</i>	Hooded Pitta	115-575	L,P	

<i>Hirundo rustica</i>	Barn Swallow	0-50	K	M
<i>Hirundo tahitica</i>	Pacific Swallow	0-50	K	
<i>Coracina temminckii</i>	Caerulean Cuckoo-shrike	155-440	L,P	E
<i>Coracina bicolor</i>	Pied Cuckoo-shrike	0-255	S,P	E,NT
<i>Coracina leucopygia</i>	White-rumped Cuckoo-shrike	0-215	M,S,L,P	E
<i>Coracina morio</i>	Sulawesi Cicadabird	0-575	S,L,P	E
<i>Lalage leucopygialis</i>	Sulawesi Triller	140-275	S,L,P	E
<i>Trichastoma celebense</i>	Sulawesi Babbler	0-585	S,L,P	E
<i>Ficedula rufigula</i>	Rufous-throated Flycatcher	50-350	L,P	E,NT
<i>Culicicapa helianthea</i>	Citrine Flycatcher	0-480	S,M,L,P	
<i>Gerygone sulphurea</i>	Flyeater	0-50	M	
<i>Hypothymis azurea</i>	Black-naped Monarch	0-570	S,L,P	
<i>Dicaeum aureolimbatum</i>	Yellow-sided Flowerpecker	0-440	M,S,L,P	E
<i>Dicaeum celebicum</i>	Grey-sided Flowerpecker	0-585	M,S,L,P	E
<i>Anthreptes malacensis</i>	Brown-throated Sunbird	0-500	M,S,L,P	
<i>Nectarinia aspasia</i>	Black Sunbird	0-600	M,S,L,P	
<i>Nectarinia jugularis</i>	Olive-backed Sunbird	0-600	M,S,L,P	
<i>Aethopyga siparaja</i>	Crimson Sunbird	100-370	L,P	
<i>Zosterops atrifrons</i>	Black-fronted White-eye	0-590	M,S,L,P	
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater	500-600	P	
<i>Lonchura molucca</i>	Black-faced Munia	0	S,K	
<i>Lonchura punctulata</i>	Scaly-breasted Munia	0	M,S	
<i>Lonchura malacca</i>	Chestnut Munia	0-85	M,S,K	
<i>Passer montanus</i>	Tree Sparrow	0-40	K	
<i>Aplonis panayensis</i>	Asian Glossy Starling	0-50	M,K	
<i>Basilornis celebensis</i>	Short-crested Myna	35-275	S,L	E
<i>Streptocitta albigollis</i>	White-necked Myna	205-440	L,P	E
<i>Scissirostrum dubium</i>	Finch-billed Myna	0-475	M,S,L	E
<i>Oriolus chinensis</i>	Black-naped Oriole	0-545	S,L,P	
<i>Dicrurus montanus</i>	Sulawesi Drongo	265-585	L,P	E
<i>Dicrurus hottentottus</i>	Hair-crested Drongo	0-410	S,L,P	
<i>Artamus leucorhynchus</i>	White-breasted Wood-swallow	0-435	M,S,K	
<i>Artamus monachus</i>	Ivory-backed Wood-swallow	0-50	M,S	E
<i>Corvus enca</i>	Slender-billed Crow	0-50	S,K	