

The avifauna of Mt. Karimui, Chimbu Province, Papua New Guinea, including evidence for long-term population dynamics in undisturbed tropical forest

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SUMMARY.—We conducted ornithological field work on Mt. Karimui and in the surrounding lowlands in 2011–12, a site first surveyed for birds by J. Diamond in 1965. We report range extensions, elevational records and notes on poorly known species observed during our work. We also present a list with elevational distributions for the 271 species recorded in the Karimui region. Finally, we detail possible changes in species abundance and distribution that have occurred between Diamond's field work and our own. Most prominently, we suggest that Bicolored Mouse-warbler *Crateroscelis nigrorufa* might recently have colonised Mt. Karimui's north-western ridge, a rare example of distributional change in an avian population inhabiting intact tropical forests.

The island of New Guinea harbours a diverse, largely endemic avifauna (Beehler *et al.* 1986). However, ornithological studies are hampered by difficulties of access, safety and cost. Consequently, many of its endemic birds remain poorly known, and field workers continue to describe new taxa (Pratt 2000, Beehler *et al.* 2007), report large range extensions (Freeman *et al.* 2013) and elucidate natural history (Dumbacher *et al.* 1992). Of necessity, avifaunal studies are usually based on short-term field work. As a result, population dynamics are poorly known and limited to comparisons of different surveys or differences noticeable over short timescales (Diamond 1971, Mack & Wright 1996).

Here, we report new distributional and ecological observations made during field work on Mt. Karimui, Chimbu Province. Mt. Karimui's avifauna was studied by Jared Diamond in 1965 (Diamond 1972) and we purposely returned to the same ridge he worked. Analysis of elevational changes in Mt. Karimui's avifauna will be presented elsewhere; here, we describe our survey results, including differences from Diamond's historical transect that may reflect avifaunal changes. Tropical bird communities in undisturbed forest are seldom subject to long-term monitoring studies, but populations are thought to be relatively stable (Munn 1985, Greenberg & Gradwohl 1997, Brooks *et al.* 2005, Martinez & Gomez 2013), albeit with local extinctions and colonisations well documented in fragmented forest (Willis 1974, Robinson 1999, Brook *et al.* 2003, Sodhi *et al.* 2004). Finally, we present a comprehensive list of Mt. Karimui's birds, including known elevational ranges and conservation status.

Methods

Study site.—The extinct volcano of Mt. Karimui lies in the southern part of New Guinea's Central Ranges, in Chimbu Province (Fig. 1). Satellite imagery and maps clearly demonstrate Mt. Karimui to be an old volcano with a blown-out caldera. However, when viewed from the Karimui Plateau it appears as a series of discrete peaks. These ridges rise steeply from the relatively level Karimui Plateau (c.1,100 m), and are tallest in the north, where they reach c.2,550 m. Whereas Mt. Karimui is covered in primary forest, a significant part of the fertile Karimui Plateau is under small-scale agriculture, particularly at Karimui Station, a government post c.6 km north-east of Mt. Karimui. For our purposes, we define

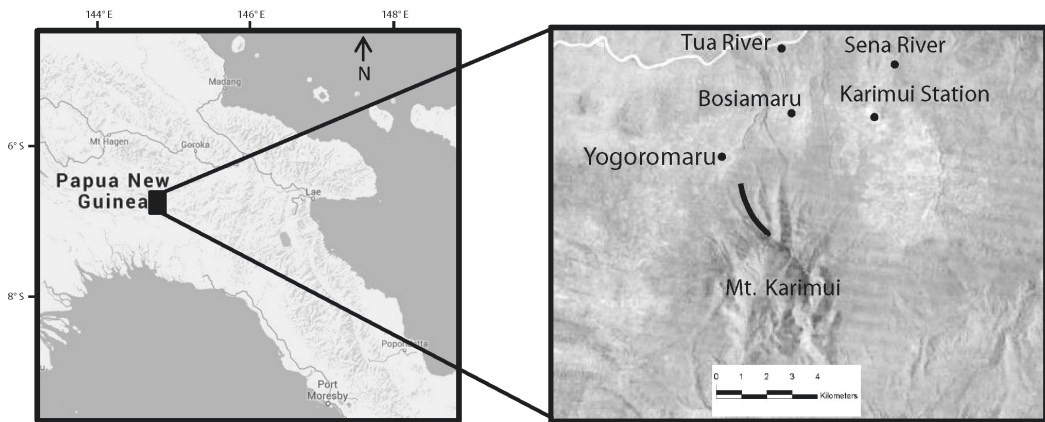


Figure 1. Map of Mt. Karimui, Chimbu Province, Papua New Guinea. The airstrip at Karimui Station, served primarily by small aircraft from Goroka, provides the principal access to the area. Our field work was concentrated on Mt. Karimui's north-west ridge above Yogoromaru village, the same ridge surveyed by Diamond (1972). The transect we surveyed is marked by the black line. See Table 1 for more information on site locations.

the Karimui area as the northern slopes of Mt. Karimui and adjacent Karimui Plateau south and east of the Tua River (see Fig. 1). All field work reported here pertains to this 'Karimui area': the southern ridges, foothills and adjacent lowlands of Mt. Karimui are ornithologically unexplored.

We first visited Mt. Karimui in 2011 during a week-long exploratory visit. We returned for two field seasons in 2012 to survey its birdlife: 13 June to 27 July (June–July) and 12 October to 14 December (October–December). Field work was concentrated on the same ridge studied by Diamond in 1965, Mt. Karimui's north-west ridge located above Yogoromaru village (Diamond 1972, see Fig. 1). In 1965, this ridge was entirely covered by primary forest. Environmental changes in the intervening years have been minor; we found it to be covered with primary forest above *c.*1,200 m, with the exception of two recently cleared small (*c.*1 ha) patches, the first a subsistence garden at 1,280 m and the second a clearing at the base of a recently constructed cellphone tower at the summit (2,520 m). To facilitate comparisons with previous data, we avoided surveying in the vicinity of non-forest habitats. We therefore conducted lower elevation field work (at 1,130–1,330 m) on an entirely forested ridge 0.5 km east of Mt. Karimui's north-west ridge (Camp 3, see Table 1), then surveyed the spine of the ridge from 1,330 m to the summit at 2,520 m (based at Camps 1–2, see Table 1). We also visited several lower elevation sites for short periods (see Table 1 for sites and survey effort).

Field work.—We censused bird communities using mist-net surveys, point counts and *ad lib* observations (Table 1). Mist-net surveys in June–July were made along the spine of Mt. Karimui's north-west ridge, with a single mist-net survey at Bosiamaru (see Table 1). Mist-nets touched the ground in order to trap terrestrial species. Along Mt. Karimui's north-west ridge, we used flagging tape to partition the ridge into sections of 25 vertical m (e.g. 1,400–1,425 m). We measured elevation using the barometric altimeter in a Garmin 62S GPS unit, calibrated at Karimui airstrip (1,112 m per Diamond 1972) and using the average of readings taken on multiple days. We mist-netted along the ridgeline in discrete 'segments' of 24–30 nets (corresponding to 100–175 m elevation), and opened nets from 06.00 h to 13.00 h for two days per segment. Mist-nets were not operated in rain. Upon finishing one segment, we moved nets to higher elevations along the same trail and repeated the

TABLE 1

Location of field sites surveyed in the Karimui area, with approximate survey effort and brief habitat description. The vast majority of field work occurred in the vicinity of our three field camps along Mt. Karimui's north-west ridge.

| | Elevation (m) | Latitude | Longitude | Survey type | Survey effort | Habitat |
|----------------------|---------------|-----------|------------|--|----------------|---|
| Mt. Karimui Camp 1 | 1,420 | 06°54.123 | 144°74.263 | Mist-nets; point counts | c.45 man-days | Tall primary forest near base of ridgeline |
| Mt. Karimui Camp 2 | 1,890 | 06°54.693 | 144°75.250 | Mist-net; point counts | c.45 man-days | Primary montane forest with epiphyte-laden trees, some bamboo tangles |
| Mt. Karimui Camp 3 | 1,240 | 06°52.748 | 144°74.518 | Mist-nets; point counts | 20 man-days | Tall primary forest at Mt. Karimui's base |
| Yogoromaru | c.1,100 | 06°50.672 | 144°74.178 | Qualitative observations | four man-days | Mostly agricultural landscape |
| Karimui Station area | c.1,100 | 06°49.254 | 144°82.473 | Qualitative observations | c.20 man-days | Mostly agricultural landscape |
| Bosiamaru | 1,100–1,150 | 06°50.689 | 144°80.149 | Mist-nets | six man-days | Second growth, heavily hunted |
| Sena River | 750 | 06°47.735 | 144°83.475 | Qualitative observations of 'salt lick' site | three man-days | Second growth, heavily hunted |
| Tua River | 570 | 06°45.176 | 144°78.164 | Qualitative observations | two man-days | Mix of second growth and primary forest |

process. Our net-line stretched unbroken from 1,330 m to 2,200 m in this fashion. Difficult terrain in the high-elevation elfin forest permitted only scattered mist-netting above 2,200 m and entirely prevented it above 2,400 m. Finally, we mist-netted in lower elevation forest (1,130–1,330 m) along a parallel ridge (described above, Camp 3, see Table 1). Importantly, this mist-net effort closely matches that of Diamond (1972), who likewise ran a nearly continuous mist-net lane along Mt. Karimui's north-west ridge. Unlike Diamond, we did not collect specimens. Instead, individuals trapped were weighed, measured (wing, tail, culmen, tarsus), scored for moult and photographed. We also took blood samples from the brachial vein of the majority of captured individuals. Finally, we clipped the distal portion of the right three outer rectrices, permitting easy diagnosis of recaptures.

One observer (BGF) completed point counts in both 2012 field seasons on Mt. Karimui's north-west ridge. Point counts in June–July were at 1,130–2,520 m ($n = 40$); in October–December at 1,330–2,520 m ($n = 30$). Each point count location was at least 150 m distant from neighbouring point count sites. We conducted five-minute audiovisual point counts, repeating counts on each of three separate mornings (06.00–12.00 h, mostly 06.30–09.00 h). We augmented our quantitative surveys with qualitative observations lacking effort information during the course of field work. Survey effort on Mt. Karimui's ridge was approximately equal between Diamond's July–August transect (33 days) and our June–July (38 days) and October–December (34 days) field seasons, facilitating comparisons. Audio-recordings will be archived at the Macaulay Library of Natural Sounds at the Cornell Lab of Ornithology, Ithaca, NY, while observational data are archived in the Avian Knowledge Network via eBird.

Results

Some 271 bird species occur in the Karimui area, with a further four species reported by local informants (Appendix 1). This total sums extensive field work by ourselves and Diamond, and is probably near-complete. Nevertheless, species richness estimated by Diamond's survey and our own differed: we documented 245 species, Diamond 234. These different totals largely reflect geographic differences in survey effort. Diamond (1972) spent more time at low elevations on the Karimui Plateau and employed native hunters to collect specimens, while our field work was concentrated on Mt. Karimui's slopes. However, research effort on Mt. Karimui's north-west ridge was qualitatively similar between historical and modern transects, suggesting that some of the observed differences may reflect changes in species' populations. Diamond's extensive surveys on Mt. Karimui lack quantitative effort data: our mist-net effort summed 3,665 net-hours, during which time we captured 977 individuals of 91 species. Point counts detected 130 species in 2,082 species / point count combinations. We describe our observations of population dynamics, elevational range extensions and ecological notes for 21 species below.

DWARF CASSOWARY *Casuarius bennetti* / **SOUTHERN CASSOWARY** *C. casuarius*
Cassowaries are New Guinea's largest terrestrial animals and highly valued for their meat (Beehler *et al.* 1986). Informants consistently described them as largely extirpated from the Karimui region, correlating their disappearance to a period of intense hunting in the 1960s and 1970s when metal snares were first used. We never encountered cassowary droppings in the forest—which are frequently encountered where cassowaries are present (BGF pers. obs.)—and saw just one captive bird, a Dwarf Cassowary chick acquired by a Yogoromaru hunter from a remote and seldom-hunted location near the Tua River. The species resident in the Karimui area is Dwarf Cassowary. However, informants described Southern Cassowary as resident in the lowlands south of Mt. Karimui, and reported it to occasionally venture to the Karimui area treated by this manuscript.

COLLARED BRUSHTURKEY *Talegalla jobiensis* /
BLACK-BILLED BRUSHTURKEY *T. fuscirostris*

Talegalla are shy forest-dwellers with braying vocalisations. Due to the difficulty in identifying *Talegalla* vocalisations to species, distributional knowledge is poor. For example, Diamond was unable to identify which *Talegalla* inhabits Mt. Karimui (Diamond 1972) and it was only recently that Collared Brushturkey was documented south of New Guinea's Central Ranges (Mack & Wright 1996). We frequently heard *Talegalla* vocalisations below 1,890 m, eventually photographing a Collared Brushturkey at its mound nest at 1,390 m. We suspect Black-billed Brushturkey also occurs at Karimui and replaces Collared Brushturkey at lower elevations: our best local informant described the green-legged Black-billed Brushturkey as a common resident near the Tua River. We consider this informant credible, as he accurately described the leg colours and preferred elevations of the three megapodes we encountered, the montane Collared and Wattled Brushturkeys *Aepygpodius arfakianus* and widespread Orange-footed Scrubfowl *Megapodius reinwardt*.

PAPUAN EAGLE *Harpyopsis novaeguineae*

We recorded this raptor only a few times: one was observed perched in the canopy at 1,300 m in 2011, and vocalising birds were heard *c.*3 times in 2012 at our 1,420 and 1,890 m camps. While never abundant throughout its range, this eagle is usually easily detected by voice in forested montane environments (Beehler *et al.* 1986; BGF pers. obs.). Diamond (1972)

noted the species on Mt. Karimui, but did not assess its relative abundance, which often correlates with hunting levels (K. D. Bishop pers. comm.), and we consider it probable that this species is impacted by hunting at Karimui. For example, one local informant showed us a full set of talons from a bird hunted in early 2012 and several informants told us that hunters frequently target Papuan Eagles.

BUFF-BANDED RAIL *Gallirallus philippensis*

Widespread throughout Melanesia, colonising even remote Pacific islands (Beehler *et al.* 1986). We found it relatively common in agricultural areas at Karimui Station. Diamond did not record it. It is unlikely that Diamond overlooked this rail: he surveyed appropriate habitats near Karimui airstrip and collected five Rufous-tailed Bush-hens *Amaurornis moluccana* (Diamond 1972), a more secretive species (BGF pers. obs.). It is therefore probable that Buff-banded Rail—an excellent coloniser (Diamond & LeCroy 1979)—has recently colonised the area, presumably in response to the large increase in agricultural land since 1965.

RUFESCENT IMPERIAL PIGEON *Ducula chalconota*

We regularly heard this montane pigeon on Mt. Karimui. Diamond (1972) was familiar with its distinctive vocalisations, but did not find it on Mt. Karimui. Because columbids regularly undertake seasonal movements and are difficult to detect when not vocal (Diamond 1972), this species may have been overlooked by Diamond or was rare or absent at the time of his survey.

ZOE'S IMPERIAL PIGEON *Ducula zoeae*

We found this lowland species well above its published elevation limit of 1,500 m (Baptista *et al.* 1997). In June–July, it was one of the most commonly detected species on point counts, vocally abundant to c.1,900 m with some heard up to 2,080 m. It probably undertakes seasonal elevational movements: in October–November, we recorded this species infrequently and only below 1,620 m.

STRIATED LORIKEET *Charmosyna multistriata*

Formerly considered absent from Papua New Guinea's southern watershed (Beehler *et al.* 1986). We identified the species on three occasions in November 2012 at our 1,420 m camp. All observations were of small flocks (2–4 birds) in flight, identified by their all-green coloration with yellowish-streaked underparts, distinct from the similar Goldie's Lorikeet *Psittuteutes goldiei*, also present. Lorikeets are difficult to positively identify in flight and our records should be considered provisional. *C. multistriata* is nomadic, often present at a site for several years before disappearing (K. D. Bishop pers. comm.). Our probable records and recent observations from the Crater Mountain area immediately east of the Karimui Plateau (Mack & Wright 1996) suggest this species' wanderings include much of Papua New Guinea's southern watershed.

LORIKEET SP. *Charmosyna* sp.

We observed a vocalising *Charmosyna* in August 2011, when an adult flew by at eye level on the rim of the Karimui Plateau. We judged it to be smaller than Coconut Lorikeet *Trichoglossus haematodus*, the commonest lorikeet at the site, and provisionally identified it as Josephine's Lorikeet *Charmosyna josefinae* based on its relatively large size, very long yellow-tipped tail and red rump. However, we could not conclusively eliminate other *Charmosyna* species (e.g. Papuan Lorikeet *C. papou*) and Josephine's Lorikeet has not been

documented east of Mt. Bosavi (Collar 1997), c.175 km west of Mt. Karimui. This was our sole, possible, observation suggesting it may be an occasional visitor to the region and that future field workers should remain alert for Josephine's Lorikeet.

PESQUET'S PARROT *Psittrichas fulgidus*

Prized for its vermilion and black flight feathers, hunting has extirpated this species in many locations (Beehler *et al.* 1986, Mack & Wright 1998). We did not record it on the Karimui Plateau, where hunting pressure has been intense for at least 50 years (Wagner 1967). In fact, hunting may have formerly almost extirpated the species from the entire Karimui area: Diamond observed the species just once during several months of field work on the Karimui Plateau and on Mt. Karimui. However, we regularly observed pairs or small groups roosting around our 1,420 m and 1,890 m camps, suggesting that it is currently uncommon on the slopes of Mt. Karimui. Local informants reported the species to be fairly common in parts of the Tua River Valley far from human settlements.

PACIFIC KOEL *Eudynamys orientalis*

Regularly heard up to 2,120 m, well above its previously known elevational ceiling of 1,500 m (Beehler *et al.* 1986).

WHITE-CROWNED CUCKOO *Cacomantis leucolophus*

This lowland species generally occurs below 1,740 m (Coates 1985). We frequently heard it during both 2012 field seasons up to c.2,200 m, with one record from 2,520 m in July 2012. We have also heard the species at 2,200–2,300 at Hogave, Mt. Michael, Eastern Highlands, and it is regularly encountered at other highland locations (e.g. Ambua Lodge near Tari, Papua New Guinea; K. D. Bishop pers. comm.): It is probably widespread in montane forest.

HOOK-BILLED KINGFISHER *Melidora macrorrhina*

Commonly heard pre-dawn up to 1,870 m. This is a new high-elevation record for this lowland species, which was previously known only to 1,280 m (Woodall 2001).

YELLOWISH-STREAKED HONEYEATER *Ptiloprora meekiana*

This rare and unobtrusive montane species is probably nomadic (K. D. Bishop pers. comm.), and has been recorded only a few times in the Central and Eastern Highlands of Papua New Guinea (Higgins *et al.* 2008). We did not find it in June–July 2012, nor did Diamond record this species in 1965. However, we observed one in a flowering tree at 1,880 m on three consecutive days in October 2012.

BICOLORED MOUSE-WARBLER *Crateroscelis nigrorufa*

Patchily distributed throughout montane New Guinea. When present, it occupies a narrow elevational band between the closely related lowland Rusty Mouse-warbler *C. murina* and montane Mountain Mouse-warbler *C. robusta*. Despite extensive mist-netting effort and numerous mist-netted Rusty and Mountain Mouse-warblers, Diamond did not record Bicolored Mouse-warbler on Mt. Karimui in 1965. In contrast, we mist-netted 16 *C. nigrorufa* in June–July 2012 (1,620–1,940 m) and regularly observed small parties during both field seasons. Given that Diamond operated a series of mist-nets across the entire elevational zone (J. Diamond pers. comm.), we consider it highly unlikely that this species was overlooked by him. Instead, we suggest that this species was very rare or truly absent on Mt. Karimui's north-west ridge in 1965 and has since become relatively common.

SCRUBWREN SP. *Sericornis* sp.

We observed small flocks of an unidentified scrubwren (*Sericornis* sp.) on six occasions at 1,280–1,355 m. Flocks comprised 3–8 individuals that foraged 1–12 m above ground. Three were mist-netted at 1,310 m and blood samples taken. They were morphologically similar (if not identical) to Large Scrubwren *S. nouhuysi*, which was commonly seen and mist-netted above 1,470 (AMCF photographs). However, the only *Sericornis* we observed at 1,355–1,470 m was the much smaller Grey-green Scrubwren *S. arfakianus*. Although speculative, these unidentified lower elevation *Sericornis* could represent a new population of Perplexing Scrubwren *S. virgatus*, a phenotypically variable low-elevation species confusingly similar to Large Scrubwren. This possibility is bolstered by recent records of Perplexing Scrubwren in southern Papua New Guinea (J. Diamond pers. comm.). Genetic studies are necessary to evaluate the taxonomic status of these unidentified scrubwrens.

CHESTNUT-BACKED JEWEL-BABBLER *Ptilorrhoa castanonota* /**SPOTTED JEWEL-BABBLER** *P. leucosticta*

Many species in tropical mountains are elevational replacements (closely related species with parapatric elevational distributions: Diamond 1973, Terborgh & Weske 1975, Jankowski *et al.* 2012, Freeman *et al.* 2013). Range borders are often very abrupt, but elevational gaps sometimes exist between two replacements (Terborgh & Weske 1975). For example, Diamond noted a substantial gap between the foothill Chestnut-backed Jewel-babbler and montane Spotted Jewel-babbler on Mt. Karimui (Diamond 1972). This gap appears to have been maintained. We expended significant effort determining *Ptilorrhoa* elevational distributions, and found a gap between the highest Chestnut-backed Jewel-babbler territory at 1,460 m and the lowest Spotted Jewel-babbler territory at 1,510 m.

RUFOUS-NAPED WHISTLER *Aleadyras rufinucha*

Regularly recorded above 1,920 m. Our only record below this was a juvenile mist-netted at 1,300 m, which echoes records of juveniles of other species found well outside their typical elevational distributions in New Guinea, supporting the hypothesis that juveniles disperse beyond regular altitudinal limits (Diamond 1972, Freeman *et al.* 2013).

SINGING STARLING *Aplonis cantoroides*

This urban / agricultural species has greatly expanded its distribution in response to urbanisation of New Guinea's landscape. It was not recorded by Diamond at Karimui in 1965. However, we observed a small flock on four occasions in 2012, in a small grove of fig trees adjacent to Karimui airstrip. Local informants declared that the species had arrived within the past decade, but is only seen in the vicinity of the airstrip.

LAWES'S PAROTIA *Parotia lawesii*

Regularly observed by Diamond (1972), who collected six specimens on Mt. Karimui's north-west ridge. In contrast, despite many weeks of field work at appropriate elevations, our sole observation was a pair at 1,640 m in November 2012. Parotias are vocal and easily detected (BGF pers. obs.) suggesting that the species has declined in abundance along Mt. Karimui's north-west ridge since 1965.

BANDED YELLOW ROBIN *Poecilodryas placens*

Diamond (1972) found this species near Karimui Station, where he collected two specimens and repeatedly observed lone individuals foraging in the understorey. We did not encounter this easily mist-netted and vocally distinctive understorey species in primary

forest at Karimui Station, nor did we detect it during opportunistic field work at lower elevations. However, we were unable to mist-net in lower elevation (<1,000 m) forest on the Karimui Plateau. Thus, it is unclear if the species persists, even patchily, in the region or is truly absent.

We also documented minor elevational records (<250 m above previously reported limits) for 12 additional species. **STEPHAN'S EMERALD DOVE** *Chalcophaps stephani*: mist-netted at 1,390 m, observed at 1,420 m camp, vs. below 1,200 m (Baptista *et al.* 1997). **RED-CHEEKED PARROT** *Geoffroyus geoffroyi*: to 1,240 m, vs. below 1,113 m (Diamond 1972). **VARIABLE DWARF KINGFISHER** *Ceyx lepidus*: mist-netted to 1,385 m, vs. below 1,300 m (Woodall 2001). **WHITE-EARED CATBIRD** *Ailuroedus buccoides*: mist-netted to 1,300 m, vs. below 1,200 m (Mack & Wright 1996). **TAWNY-BREASTED HONEYEATER** *Xanthotis flaviventer*: to 1,660 m, vs. below 1,500 m (Higgins *et al.* 2008). **RUBY-THROATED MYZOMELA** *Myzomela eques*: to 1,310 m, vs. below 1,200 m (Higgins *et al.* 2008). **GREY-GREEN SCRUBWREN** *Sericornis arfakianus*: to 1,780 m, vs. below 1,700 m (Gregory 2007). **YELLOW-BELLIED GERYGONE** *Gerygone chrysogaster*: to 1,030 m, vs. below 800 m (Beehler *et al.* 1986). **GOLDENFACE** *Pachycare flavogriseum*: to 1,920 m, vs. below 1,800 m (Boles 2007). **GOLDEN CUCKOOSHRIKE** *Campochaera sloetii*: to 1,240 m, vs. below 1,100 m (Taylor 2005). **SOOTY THICKET FANTAIL** *Rhipidura threnothorax*: to 1,240 m, vs. to 1,100 m (Boles 2006). **BLACK-FRONTED WHITE-EYE** *Zosterops atrifrons*: to 1,700 m, vs. below 1,460 m (van Balen 2008).

Discussion

Our studies confirm the high avian diversity of Mt. Karimui and the Karimui Plateau: 271 species are documented to occur, a total comparable to other extensively surveyed New Guinean elevational gradients (Freeman *et al.* 2013), and remarkably high given the absence of lakes, marshes and both low-elevation (<500 m) and upper montane forests (>2,500 m) in the Karimui area. Mt. Karimui's avian diversity includes many species detected during our field work but not by Diamond (1972) in 1965. Conversely, we failed to detect several species reported by Diamond (1972).

Avian community dynamics in the tropics have been seldom studied in undisturbed forests. The sparse data that exist support the hypothesis that tropical bird populations are relatively stable through time, especially among forest-dwelling insectivores (Munn 1985, Brooks 2005, Martinez & Gomez 2013). We lack quantitative data to statistically assess population changes in Mt. Karimui's avifauna. Nevertheless, several species may have undergone substantial population changes during this interval. Most obviously, Bicolored Mouse-warbler was apparently absent on Mt. Karimui's north-west ridge in 1965 but relatively common in 2012. We believe this is the most extreme example of population changes in a resident understorey tropical bird in undisturbed forest. Bicolored Mouse-warbler is patchily distributed across New Guinea and inhabits a narrow elevational zone between two more widespread congeners (Beehler *et al.* 1986, Freeman *et al.* 2013), distributional attributes that may predispose this species to local colonisations and extinctions at individual sites (Diamond 1973). Conversely, it seems that the Lawes's Parotia has almost disappeared from Mt. Karimui's north-west ridge since 1965. Examples of local colonisations and extinctions in disturbed tropical habitats are much more common (Diamond 1971), and we documented the probable recent colonisation of agricultural habitats on the Karimui Plateau by Buff-banded Rail and Singing Starling.

Distributional ecology.—Distributional data describing range limits of New Guinean birds have been previously used to test hypotheses of community assembly and

diversification (Diamond 1973, Diamond 1986, Mack & Dumbacher 2007). We briefly comment on one well-known pattern—the tendency for closely related species to replace one another parapatrically along elevational gradients (Diamond 1986, Freeman *et al.* 2013). Elevational replacements occur in tropical mountains worldwide in many taxa. Understanding the ecological factors that maintain their parapatric distributions is an active arena of ecological research, focused on answering the question of why elevational gradients contain multiple closely related species that partition elevational space, instead of just one widespread species (Jankowski *et al.* 2012).

However, the contribution of elevational replacements to tropical montane biodiversity is seldom quantified. We updated Diamond's (1972) list of elevational replacements on Mt. Karimui. Nearly all elevational replacements are congeners with similar body sizes and diets. In total, we identified 24 pairs, five trios and two quartets of elevational replacements on Mt. Karimui (71 species; Appendix 1). Why do 71 species with narrow elevational distributions exist instead of 31 more widespread species? Providing a satisfactory answer to this question is beyond our scope, but these statistics demonstrate that elevational replacements comprise a significant portion of Mt. Karimui's avian diversity. Mt. Karimui contains 238 species of forest-dwelling birds (Appendix 1), a total 20.2% higher than it would be if all 40 'ecologically redundant' elevational replacements were excluded. This coarse analysis is one of the first to explicitly quantify the contribution of elevational replacements to montane biodiversity for a taxonomic group (Terborgh & Weske 1975), strengthening the hypothesis that elucidating the evolution of elevational distributions is a key component of understanding montane biodiversity in New Guinea (Diamond 1973, 1986).

Conservation.—Conserving Mt. Karimui's diverse avifauna is a significant challenge. The principal negative impacts on bird populations result from hunting and, increasingly, forest clearance. The latter will almost certainly be the main cause of avifaunal declines in the Karimui area in the near future. Human population on the Karimui Plateau has quintupled since the early 1960s (Wagner 1967; J. Anuabo pers. comm.), with concomitant habitat loss due to both subsistence and cash-crop (e.g. coffee) agriculture, with forest clearance likely to accelerate via current plans to construct a road to Karimui. Conserving entire elevational gradients of primary forest provides watershed benefits to local communities while conserving the vast majority of montane biodiversity and providing space to accommodate climate change-driven range shifts (Laurance *et al.* 2011).

Bird populations may also be impacted by hunting. We did not attempt to document the impact of hunting on Mt. Karimui, but did collect several observations consistent with the hypothesis that it affects populations of several species. Subsistence hunting remains common in New Guinean cultures (Wagner 1967). We frequently encountered boys and men hunting birds with slingshots and / or bow-and-arrows, and observed numerous hunting blinds. The latter are used especially frequently (daily or near-daily) during droughts or if located near 'salt licks' where birds, especially columbids, gather to drink water and / or ingest grit or minerals (Diamond *et al.* 1999, Symes *et al.* 2006). Informants reported regularly taking large numbers (>10) of birds, principally columbids, on single visits to such sites. Lastly, it is common practice to consume eggs or nestlings on encountering an active nest, even of small (<15 g) passerines. It is probable that hunting has significantly impacted populations of certain species. For example, Dwarf Cassowary is extirpated from accessible parts of the Karimui Plateau and Mt. Karimui. Likewise, *Talegalla* brushturkeys are absent from forests around Karimui Station, even in large tracts of primary forest. Additionally, Papuan Eagle and Pesquet's Parrot appear to be largely absent from the Karimui Plateau, although the parrot persists on the lower slopes of Mt. Karimui, in rugged terrain near the

Tua River, and may be increasing. These species are regularly targeted by hunters, and it is probable that their distributions are currently limited by hunting pressure.

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Appendix 1: Complete list of the Karimui area avifauna

Nomenclature follows IOC classification (Gill & Donsker 2013). Conservation status reflects IUCN classification (IUCN 2013), while habitat classifications are based on Beehler *et al.* (1986) and pers. obs. Elevational replacements (pairs, trios and quartets) are based on references (Diamond 1972, Beehler *et al.* 1986) and pers. obs. We note those bird species documented by our recent field work and those by Diamond (1972). We also report elevational distributions at Mt. Karimui of most forest-dwelling species. We describe high elevation limits for many species, and low elevation limits for those species whose lower limit lies above c.1,100 m. Finally, we summarise additional information pertaining to our observations as brief notes. Habitats: F = Forest, Ag = Agricultural, Aq = Aquatic. Conservation status: VU = Vulnerable, NT = Near Threatened, DD = Data Deficient.

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|--------------------|----------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|---|
| Southern Cassowary | <i>Casuarius casuarius</i> | F | VU | pair, low | | | | | Reported by informants to occur near border of Chimbu and Gulf provinces |
| Dwarf Cassowary | <i>Casuarius bennetti</i> | F | NT | pair, high | | | | | Reported by informants to persist in remote forests, one captive bird in Yogoromaru village |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-----------------------------|-----------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|--|
| Wattled Brushturkey | <i>Aepyodius arfakianus</i> | F | | | X | X | | | Heard several times around 1,890 m camp |
| Black-billed Brushturkey | <i>Talegalla fuscirostris</i> | F | | pair, low | | | | | Reported by informants to occur below c.800 m |
| Collared Brushturkey | <i>Talegalla jobiensis</i> | F | | pair, high | X | | | 1,893 | |
| Orange-footed Scrubfowl | <i>Megapodius reinwardt</i> | F | | | X | X | | 1,923 | |
| Brown Quail | <i>Coturnix ypsilophora</i> | Ag | | | | | | | Reported by informants to occur in agricultural land |
| Salvadori's Teal | <i>Salvadorina waigiensis</i> | Aq | VU | | X | X | | | Seen at Sena River (730 m) and Tua River (550 m) |
| Great Egret | <i>Ardea alba</i> | Aq | | | X | | | | Seen once at Tua River (550 m) |
| Pied Heron | <i>Egretta picata</i> | Aq | | | | X | | | |
| Little Black Cormorant | <i>Phalacrocorax sulcirostris</i> | Aq | | | X | | | | Seen once at Sena River (730 m) |
| Pacific Baza | <i>Aviceda subcristata</i> | Ag | | | X | X | | 1,203 | |
| Long-tailed Honey Buzzard | <i>Henicopernis longicauda</i> | F | | | X | X | | 2,263 | |
| Papuan Eagle | <i>Harpyopsis novaeguineae</i> | F | VU | | X | X | | 1,888 | Scarce |
| Pygmy Eagle | <i>Hieraaetus weiskei</i> | F | | | X | | | | Seen once at 1,300 m |
| Chestnut-shouldered Goshawk | <i>Erythrotriorchis buergersi</i> | F | DD | | | X | | | |
| Doria's Goshawk | <i>Megatriorchis doriae</i> | F | | | | X | | | |
| Variable Goshawk | <i>Accipiter hiogaster</i> | Ag | | | X | X | | | Seen 3–4 times around Karimui Station |
| Brown Goshawk | <i>Accipiter fasciatus</i> | Ag | | | | X | | | |
| Black-mantled Goshawk | <i>Accipiter melanochlamys</i> | F | | pair, high | X | X | 1,423 | 2,143 | |
| Grey-headed Goshawk | <i>Accipiter poliocephalus</i> | F | | pair, low | X | X | | 1,215 | |
| Collared Sparrowhawk | <i>Accipiter cirrocephalus</i> | Ag | | | X | | | | Seen once near Karimui Station |
| Swamp Harrier | <i>Circus approximans</i> | Ag | | | X | X | | | Seen once at Karimui airstrip |
| Brahminy Kite | <i>Haliastur indus</i> | F | | | X | X | | 2,383 | |
| Nankeen Kestrel | <i>Falco cenchroides</i> | Ag | | | X | X | | | Seen twice around Karimui Station |
| Oriental Hobby | <i>Falco severus</i> | F | | | | X | | | |
| Brown Falcon | <i>Falco berigora</i> | Ag | | | X | X | | | Seen regularly around Karimui Station |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|----------------------------|---------------------------------|---------|---------------------|--|----------|---------|-----------------|-----------------|--|
| Forbes's Forest Rail | <i>Rallacula forbesi</i> | F | | pair, high | X | | 1,343 | 1,763 | |
| Red-necked Crake | <i>Rallina tricolor</i> | F | | pair, low | | X | | | |
| Buff-banded Rail | <i>Gallirallus philippensis</i> | Ag | | | X | | | | Common around Karimui Station |
| Lewin's Rail | <i>Lewinia pectoralis</i> | Ag | | | X | | | | Heard once near Karimui Station |
| Pale-vented Bush-hen | <i>Amaurornis moluccana</i> | Ag | | | X | X | | | Common around Karimui Station |
| Common Sandpiper | <i>Actitis hypoleucos</i> | Aq | | | X | | | | Seen along Tua River (550 m) |
| Australian Pratincole | <i>Stiltia isabella</i> | Ag | | | X | X | | | Seen once at Karimui airstrip |
| Slender-billed Cuckoo-Dove | <i>Macropygia amboinensis</i> | F | | | X | X | | 1,903 | Very common at lower elevations (below c.1,500 m) and in anthropogenic landscapes |
| Bar-tailed Cuckoo-Dove | <i>Macropygia nigrirostris</i> | F | | largely replaces <i>M. amboinensis</i> at high elevations, but significant overlap | X | X | | 2,520 | Very common at higher elevations (above c.1,300 m), not recorded in anthropogenic areas |
| Great Cuckoo-Dove | <i>Reinwardtoena reinwardti</i> | F | | | X | X | | 2,233 | |
| Stephan's Emerald Dove | <i>Chalcophaps stephani</i> | F | | | X | X | | 1,423 | |
| New Guinea Bronzewing | <i>Henicophaps albifrons</i> | F | | | | X | | | |
| Cinnamon Ground Dove | <i>Gallicolumba rufigula</i> | F | | pair, low | X | X | | 1,288 | |
| White-breasted Ground Dove | <i>Gallicolumba jobiensis</i> | F | | | | X | | | |
| Bronze Ground Dove | <i>Gallicolumba beccarii</i> | F | | pair, high | X | X | 1,363 | 2,068 | |
| Pheasant Pigeon | <i>Otidiphaps nobilis</i> | F | | | X | X | | 1,693 | |
| Southern Crowned Pigeon | <i>Goura scheepmakeri</i> | F | VU | | | | | | Reported by elderly local informants to occur near Tua River, but unclear if still present in the Karimui area |
| Wompoo Fruit Dove | <i>Ptilinopus magnificus</i> | F | | | X | X | | 1,033 | |
| Pink-spotted Fruit Dove | <i>Ptilinopus perlatus</i> | F | | | X | X | | | Regular at Sena River salt lick (750 m) |
| Ornate Fruit Dove | <i>Ptilinopus ornatus</i> | F | | | X | X | | 2,520 | |
| Superb Fruit Dove | <i>Ptilinopus superbus</i> | F | | | X | X | | 1,273 | |
| Beautiful Fruit Dove | <i>Ptilinopus pulchellus</i> | F | | | X | X | | 1,243 | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------------|-------------------------------------|---------|---------------------|---|----------|---------|-----------------|-----------------|---|
| White-bibbed Fruit Dove | <i>Ptilinopus rivoli</i> | F | | | X | X | 1,243 | 2,105 | |
| Dwarf Fruit Dove | <i>Ptilinopus nainus</i> | F | | | X | X | | | Regular at Sena River salt lick (750 m) |
| Purple-tailed Imperial Pigeon | <i>Ducula rufigaster</i> | F | | pair, low | X | X | | 1,283 | |
| Rufescent Imperial Pigeon | <i>Ducula chalconota</i> | F | | pair, high | X | | 1,793 | 2,272 | |
| Zoe's Imperial Pigeon | <i>Ducula zoeae</i> | F | | | X | X | | 2,083 | |
| Papuan Mountain Pigeon | <i>Gymnophaps albertisii</i> | F | | | X | X | | 2,333 | |
| Palm Cockatoo | <i>Probosciger aterrimus</i> | F | | | X | X | | 1,283 | Scarce |
| Sulphur-crested Cockatoo | <i>Cacatua galerita</i> | F | | | X | X | | 2,373 | |
| Pesquet's Parrot | <i>Psittrichas fulgidus</i> | F | VU | | X | X | | 1,903 | |
| Red-breasted Pygmy Parrot | <i>Micropsitta bruijnii</i> | F | | | X | | 1,453 | 2,133 | |
| Yellowish-streaked Lory | <i>Chalcopsitta scintillata</i> | F | | | | X | | | |
| Dusky Lory | <i>Pseudeos fuscata</i> | F | | | X | X | | 1,653 | |
| Coconut Lorikeet | <i>Trichoglossus haematodus</i> | F | | | X | X | | 1,423 | |
| Goldie's Lorikeet | <i>Psitteuteles goldiei</i> | F | | | X | | | 1,933 | |
| Black-capped Lory | <i>Lorius lory</i> | F | | | X | X | | 1,508 | |
| Striated Lorikeet | <i>Charmosyna multistriata</i> | F | | | X | | | | Seen at 1,420 m camp only |
| Pygmy Lorikeet | <i>Charmosyna wilhelminae</i> | F | | | X | | | 1,933 | |
| Red-flanked Lorikeet | <i>Charmosyna placensis</i> | F | | | X | X | | 1,323 | |
| Fairy Lorikeet | <i>Charmosyna pulchella</i> | F | | | X | X | 1,323 | 1,961 | |
| Josephine's Lorikeet | <i>Charmosyna josefinae</i> | F | | | X | | | | Possibly seen once at 990 m, but requires confirmation. |
| Papuan Lorikeet | <i>Charmosyna papou</i> | F | | replaces other <i>Charmosyna</i> at high elevations | X | X | | | Seen twice, at 1,735 and 1,910 m |
| Plum-faced Lorikeet | <i>Oreopsittacus arfaki</i> | F | | | X | X | 1,943 | 2,520 | |
| Yellow-billed Lorikeet | <i>Neopsittacus musschenbroekii</i> | F | | | | X | | | |
| Brehm's Tiger Parrot | <i>Psittacella brehmii</i> | F | | | X | X | 1,765 | 2,235 | |
| Madarasz's Tiger Parrot | <i>Psittacella madaraszii</i> | F | | | X | X | | | Seen twice, at 1,820 and 1,910 m |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------------|--------------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|--|
| Red-cheeked Parrot | <i>Geoffroyus geoffroyi</i> | F | | pair, low | X | X | | 1,243 | |
| Blue-collared Parrot | <i>Geoffroyus simplex</i> | F | | pair, high | X | X | 1,033 | 1,953 | |
| Eclectus Parrot | <i>Eclectus roratus</i> | F | | | X | X | | 1,393 | |
| Papuan King Parrot | <i>Alisterus chloropterus</i> | F | | | X | X | | 1,593 | |
| Orange-breasted Fig Parrot | <i>Cyclopsitta guiliemitertii</i> | F | | pair, low | X | X | | 1,108 | |
| Double-eyed Fig Parrot | <i>Cyclopsitta diophthalma</i> | F | | pair, high | X | | 1,163 | 1,243 | |
| Large Fig Parrot | <i>Psittaculirostris desmarestii</i> | F | | | X | X | | 1,243 | |
| Ivory-billed Coucal | <i>Centropus menbeki</i> | F | | | X | X | | 1,383 | |
| Pheasant Coucal | <i>Centropus phasianinus</i> | Ag | | | X | | | | One record from near Karimui Station |
| Dwarf Koel | <i>Microdynamis parva</i> | F | | | X | X | | 1,321 | |
| Pacific Koel | <i>Eudynamis orientalis</i> | F | | | X | X | | 2,123 | |
| Rufous-throated Bronze Cuckoo | <i>Chrysococcyx ruficollis</i> | F | | pair, high | X | | 1,793 | 2,520 | |
| White-eared Bronze Cuckoo | <i>Chrysococcyx meyerii</i> | F | | pair, low | X | X | | 1,813 | |
| White-crowned Cuckoo | <i>Cacomantis leucolophus</i> | F | | | X | X | | 2,520 | |
| Chestnut-breasted Cuckoo | <i>Cacomantis castaneiventris</i> | F | | pair, low | X | X | | 1,658 | Possibly to higher elevations (overlap unclear, Fan-tailed Cuckoo vocally similar) |
| Fan-tailed Cuckoo | <i>Cacomantis flabelliformis</i> | F | | pair, high | X | | 1,763 | 2,520 | Possibly to lower elevations (overlap unclear, Chestnut-breasted Cuckoo vocally similar) |
| Brush Cuckoo | <i>Cacomantis variolosus</i> | Ag | | | X | X | | | Common in gardens |
| Oriental Cuckoo | <i>Cuculus optatus</i> | F | | | X | | | | Seen at Tua River (550 m) |
| Greater Sooty Owl | <i>Tyto tenebricosa</i> | F | | | X | | | | Heard regularly at 1,420 m camp |
| Papuan Boobook | <i>Ninox theomacha</i> | F | | | X | X | | 2,520 | |
| Marbled Frogmouth | <i>Podargus ocellatus</i> | F | | | X | X | | 1,233 | |
| Papuan Frogmouth | <i>Podargus papuensis</i> | F | | | X | X | | 1,233 | |
| White-throated Nightjar | <i>Eurostopodus mystacalis</i> | Ag | | | | X | | | |
| Papuan Nightjar | <i>Eurostopodus papuensis</i> | F | | | X | | | | Seen at Sena River (730 m) |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|---------------------------|-----------------------------------|---------|---------------------|--|----------|---------|-----------------|-----------------|---|
| Feline Owlet-nightjar | <i>Aegotheles insignis</i> | F | | | X | X | | 1,893 | Vocalisations attributed to this species heard at 1,420 and 1,910 m camps |
| Wallace's Owlet-nightjar | <i>Aegotheles wallacii</i> | F | DD | | | X | | | <i>Aegotheles</i> sp. heard below 1,500 m could not be identified to species |
| Mountain Owlet-nightjar | <i>Aegotheles albertisi</i> | F | | replaces <i>A. wallacii</i> and <i>A. bennettii</i> at high elevations | X | | | 2,520 | <i>Aegotheles</i> sp. heard at 2,520 m presumed to be this species based on elevation |
| Barred Owlet-nightjar | <i>Aegotheles bennettii</i> | F | | | | X | | | <i>Aegotheles</i> sp. heard below 1,500 m not identified |
| Moustached Treeswift | <i>Hemiprocne mystacea</i> | F | | | X | X | | 1,253 | |
| Glossy Swiftlet | <i>Collocalia esculenta</i> | F | | | X | X | | 2,520 | |
| Mountain Swiftlet | <i>Aerodramus hirundinaceus</i> | F | | | X | X | | | Commonly seen around Karimui Station |
| Oriental Dollarbird | <i>Eurystomus orientalis</i> | Ag | | | X | X | | 1,243 | |
| Hook-billed Kingfisher | <i>Melidora macrorrhina</i> | F | | | X | X | | 1,873 | |
| Shovel-billed Kookaburra | <i>Clytoceyx rex</i> | F | | | | X | | | |
| Rufous-bellied Kookaburra | <i>Dacelo gaudichaud</i> | F | | | X | X | | 1,283 | |
| Forest Kingfisher | <i>Todiramphus macleayii</i> | Ag | | | | X | | | |
| Sacred Kingfisher | <i>Todiramphus sanctus</i> | Ag | | | X | X | | | Commonly seen around Karimui Station |
| Yellow-billed Kingfisher | <i>Syma torotoro</i> | F | | pair, low | X | X | | 1,233 | |
| Mountain Kingfisher | <i>Syma megarhyncha</i> | F | | pair, high | X | X | 1,493 | 2,158 | |
| Variable Dwarf Kingfisher | <i>Ceyx lepidus</i> | F | | | X | X | | 1,388 | |
| Azure Kingfisher | <i>Ceyx azureus</i> | Aq | | | X | X | | | Seen once at Tua River (550 m) |
| Rainbow Bee-eater | <i>Merops ornatus</i> | Ag | | | X | X | | | Seen twice near Karimui Station |
| Blyth's Hornbill | <i>Rhyticeros plicatus</i> | F | | | X | X | | | Seen on 3–4 occasions |
| Red-bellied Pitta | <i>Erythropitta erythrogaster</i> | F | | | X | X | | 1,198 | |
| White-eared Catbird | <i>Ailuroedus buccoides</i> | F | | pair, low | X | X | | 1,303 | |
| Spotted Catbird | <i>Ailuroedus melanotis</i> | F | | pair, high | X | X | 1,363 | 1,703 | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------------|---------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|--|
| MacGregor's Bowerbird | <i>Amblyornis macgregoriae</i> | F | | | X | X | 1,693 | 2,243 | |
| White-shouldered Fairywren | <i>Malurus alboscapulatus</i> | Ag | | | X | X | | 1,253 | |
| Orange-crowned Fairywren | <i>Clytomyias insignis</i> | F | | | X | X | | | Family groups seen at 2,160 m and 2,350 m |
| Ruby-throated Myzomela | <i>Myzomela eques</i> | F | | | X | X | | 1,313 | |
| Red Myzomela | <i>Myzomela cruentata</i> | F | | trio, middle | X | X | | 1,423 | Lower elevation limit unclear (not observed below 1,300 m) |
| Papuan Black Myzomela | <i>Myzomela nigrita</i> | F | | trio, low | X | X | | 1,243 | |
| Red-collared Myzomela | <i>Myzomela rosenbergii</i> | F | | trio, high | X | X | 1,273 | 2,520 | |
| Green-backed Honeyeater | <i>Glycichaera fallax</i> | F | | | X | | | 1,198 | |
| Yellowish-streaked Honeyeater | <i>Ptiloprora meekiana</i> | F | | | X | | | | Seen twice at flowering tree at 1,880 m |
| Rufous-backed Honeyeater | <i>Ptiloprora guisei</i> | F | | | X | X | 1,783 | 2,520 | |
| Plain Honeyeater | <i>Pycnopygius ixoides</i> | F | | pair, low | X | X | | | Seen once at 1,010 m near Karimui Station |
| Marbled Honeyeater | <i>Pycnopygius cinereus</i> | F | | pair, high | X | X | | | Seen once at 1,420 m camp |
| Spotted Honeyeater | <i>Xanthotis polygrammus</i> | F | | | X | X | | 1,363 | |
| Tawny-breasted Honeyeater | <i>Xanthotis flaviventer</i> | F | | | X | X | | 1,663 | |
| Meyer's Friarbird | <i>Philemon meyeri</i> | F | | | | X | | | |
| New Guinea Friarbird | <i>Philemon novaeguineae</i> | F | | | X | X | | 1,243 | |
| Long-billed Honeyeater | <i>Melilestes megarhynchus</i> | F | | | X | X | | 1,633 | |
| Common Smoky Honeyeater | <i>Melipotes fumigatus</i> | F | | | X | X | 1,338 | 2,520 | |
| Olive Straightbill | <i>Timeliopsis fulvoigula</i> | F | | | X | X | 1,633 | 2,063 | |
| Black-throated Honeyeater | <i>Caligavis subfrenata</i> | F | | pair, high | X | X | 1,423 | 2,520 | |
| Obscure Honeyeater | <i>Caligavis obscura</i> | F | | pair, low | X | X | | 1,243 | |
| Yellow-browed Melidectes | <i>Melidectes rufocrissalis</i> | F | | pair, high | X | X | 1,338 | 2,520 | |
| Ornate Melidectes | <i>Melidectes torquatus</i> | F | | pair, low | X | X | 1,333 | 1,888 | |
| Mottle-breasted Honeyeater | <i>Meliphaga mimikae</i> | F | | pair, low | X | X | | 1,313 | |
| Mountain Honeyeater | <i>Meliphaga orientalis</i> | F | | pair, high | X | X | 1,423 | 1,883 | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|---------------------------|------------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|---|
| Scrub Honeyeater | <i>Meliphaga albonotata</i> | Ag | | | X | X | | | Common around Karimui Station |
| Mimic Honeyeater | <i>Meliphaga analoga</i> | F | | | X | X | 1,163 | | |
| Yellow-gaped Honeyeater | <i>Meliphaga flavirictus</i> | F | | | | X | | | |
| Puff-backed Honeyeater | <i>Meliphaga aruensis</i> | F | | | X | X | 1,158 | | |
| Rusty Mouse-warbler | <i>Crateroscelis murina</i> | F | | trio, low | X | X | 1,773 | | |
| Bicolored Mouse-warbler | <i>Crateroscelis nigrorufa</i> | F | | trio, middle | X | | 1,623 | 1,943 | |
| Mountain Mouse-warbler | <i>Crateroscelis robusta</i> | F | | trio, high | X | X | 1,873 | 2,520 | |
| Pale-billed Scrubwren | <i>Sericornis spilodera</i> | F | | quartet, lowest | X | X | | 1,513 | |
| Papuan Scrubwren | <i>Sericornis papuensis</i> | F | | quartet, highest | X | X | 1,943 | 2,520 | |
| scrubwren sp. | <i>Sericornis</i> sp. | F | | | X | | | | See species account |
| Large Scrubwren | <i>Sericornis nouhuysi</i> | F | | | X | X | 1,473 | 2,426 | |
| Buff-faced Scrubwren | <i>Sericornis perspicillatus</i> | F | | quartet, high middle | X | X | 1,703 | 2,013 | |
| Grey-green Scrubwren | <i>Sericornis arfakianus</i> | F | | quartet, low middle | X | X | 1,378 | 1,783 | One possible record from 1,200 m near Bosiamaru |
| Brown-breasted Gerygone | <i>Gerygone ruficollis</i> | F | | | X | X | 1,447 | 2,380 | |
| Large-billed Gerygone | <i>Gerygone magnirostris</i> | F | | | X | | | | Seen/heard at Sena River (730 m) |
| Yellow-bellied Gerygone | <i>Gerygone chrysogaster</i> | F | | | X | X | 1,033 | | |
| Ashy Gerygone | <i>Gerygone cinerea</i> | F | | | X | X | 2,515 | 2,520 | |
| Green-backed Gerygone | <i>Gerygone chloronota</i> | F | | | X | X | 1,383 | | |
| Fairy Gerygone | <i>Gerygone palpebrosa</i> | F | | | X | X | 1,243 | | |
| Goldenface | <i>Pachycare flavogriseum</i> | F | | | X | X | 1,923 | | |
| Loria's Satinbird | <i>Cnemophilus loriae</i> | F | | pair, low | X | X | 1,423 | 2,428 | |
| Crested Satinbird | <i>Cnemophilus macgregorii</i> | F | | pair, high | X | X | | | One male seen at ridge summit (2,520 m) |
| Yellow-breasted Satinbird | <i>Loboparadisea sericea</i> | F | NT | | X | X | 1,433 | 1,933 | |
| Black Berrypecker | <i>Melanocharis nigra</i> | F | | pair, low | X | X | 1,463 | | |
| Fan-tailed Berrypecker | <i>Melanocharis versteri</i> | F | | pair, high | X | X | 1,388 | 2,520 | |
| Streaked Berrypecker | <i>Melanocharis striativentris</i> | F | | | X | X | 1,453 | 1,873 | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------------|-------------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|---|
| Spotted Berrypecker | <i>Rhamphocharis crassirostris</i> | F | | | X | X | 2,103 | 2,323 | |
| Dwarf Longbill | <i>Oedistoma iliolophus</i> | F | | | X | X | | 1,653 | |
| Pygmy Longbill | <i>Oedistoma pygmaeum</i> | F | | | X | X | | 1,288 | |
| Slaty-headed Longbill | <i>Toxorhamphus poliopterus</i> | F | | | X | X | | 1,993 | |
| Tit Berrypecker | <i>Oreocharis arfaki</i> | F | | | X | X | 1,338 | 2,520 | |
| Crested Berrypecker | <i>Paramythia montium</i> | F | | | X | X | | | Flock seen just below summit of ridge (2,490 m) |
| Spotted Jewel-babbler | <i>Ptilorrhoa leucosticta</i> | F | | trio, high | X | X | 1,508 | 2,142 | |
| Blue Jewel-babbler | <i>Ptilorrhoa caerulescens</i> | F | | trio, middle | X | | | | Heard at Tua River (550 m) |
| Chestnut-backed Jewel-babbler | <i>Ptilorrhoa castanonota</i> | F | | trio, low | X | X | | 1,458 | Lower elevation limit not determined |
| Yellow-breasted Boatbill | <i>Machaerirhynchus flaviventer</i> | F | | pair, low | X | X | | 1,308 | |
| Black-breasted Boatbill | <i>Machaerirhynchus nigripectus</i> | F | | pair, high | X | X | 1,243 | 2,393 | |
| Lowland Peltops | <i>Peltops blainvillii</i> | F | | pair, low | | X | | | |
| Mountain Peltops | <i>Peltops montanus</i> | F | | pair, high | X | X | | 2,105 | |
| Black Butcherbird | <i>Cracticus quoyi</i> | F | | | X | X | | 1,508 | |
| Hooded Butcherbird | <i>Cracticus cassicus</i> | F | | | X | X | | 1,333 | |
| Great Woodswallow | <i>Artamus maximus</i> | F | | | X | X | | | Common around Karimui Station |
| Black-faced Cuckooshrike | <i>Coracina novaehollandiae</i> | Ag | | | | X | | | |
| Stout-billed Cuckooshrike | <i>Coracina caeruleogrisea</i> | F | | | X | X | | 1,593 | |
| Boyer's Cuckooshrike | <i>Coracina boyeri</i> | F | | | | X | | | |
| Common Cicadabird | <i>Coracina tenuirostris</i> | Ag | | | X | | | | Vocalising bird seen near Karimui Station |
| Black-shouldered Cicadabird | <i>Coracina incerta</i> | F | | | X | | | | Single seen on north slope of Mt. Karimui (1,250 m) |
| Grey-headed Cuckooshrike | <i>Coracina schisticeps</i> | F | | pair, low | X | X | | 1,363 | |
| Black Cicadabird | <i>Coracina melas</i> | F | | | X | X | | | Pair seen at Tua River (550 m) |
| Black-bellied Cuckooshrike | <i>Coracina montana</i> | F | | pair, high | X | X | 1,338 | 2,303 | |
| Golden Cuckooshrike | <i>Campochaera sloetii</i> | F | | | X | X | | 1,243 | |
| Varied Triller | <i>Lalage leucomela</i> | F | | | X | X | | 1,423 | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------------|-----------------------------------|---------|---------------------|---------------------------------------|----------|---------|-----------------|-----------------|--------------------------------------|
| Varied Sittella | <i>Daphoenositta chrysoptera</i> | F | | | | X | | | |
| Mottled Whistler | <i>Rhagologus leucostigma</i> | F | | | X | X | 1,323 | 2,520 | |
| Wattled Ploughbill | <i>Eulacestoma nigropectus</i> | F | | | X | X | 1,913 | 2,263 | |
| Rufous-naped Whistler | <i>Aleadryas rufinucha</i> | F | | | X | X | 1,303 | 2,398 | |
| Crested Pitohui | <i>Ornorectes cristatus</i> | F | | | X | X | | 1,353 | |
| Black Pitohui | <i>Melanorectes nigrescens</i> | F | | pair, high (with Little Shrikethrush) | X | X | 1,573 | 2,453 | |
| Rusty Whistler | <i>Pachycephala hyperythra</i> | F | | trio, low | X | X | | 1,353 | |
| Brown-backed Whistler | <i>Pachycephala modesta</i> | F | | | X | X | 1,810 | 2,220 | |
| Grey Whistler | <i>Pachycephala simplex</i> | F | | | X | X | | 1,463 | |
| Sclater's Whistler | <i>Pachycephala soror</i> | F | | trio, middle | X | X | 1,243 | 1,913 | |
| Regent Whistler | <i>Pachycephala schlegelii</i> | F | | trio, high | X | X | 1,753 | 2,520 | |
| Black-headed Whistler | <i>Pachycephala monacha</i> | Ag | | | X | X | | | Common around Karimui Station |
| Rusty Pitohui | <i>Pseudorectes ferrugineus</i> | F | | | X | X | | 1,143 | |
| Little Shrikethrush | <i>Colluricincla megarrhyncha</i> | F | | pair, low (with Black Pitohui) | X | X | | 1,753 | |
| Long-tailed Shrike | <i>Lanius schach</i> | Ag | | | X | | | | Regular at Karimui airstrip |
| Southern Variable Pitohui | <i>Pitohui uropygialis</i> | F | | pair, low | X | X | | 1,231 | |
| Hooded Pitohui | <i>Pitohui dichrous</i> | F | | pair, high | X | X | | 1,658 | Lower elevation limit not determined |
| Brown Oriole | <i>Oriolus szalayi</i> | F | | | X | X | | 1,443 | |
| Pygmy Drongo | <i>Chaetorhynchus papuensis</i> | F | | | X | X | | 1,713 | |
| Spangled Drongo | <i>Dicrurus bracteatus</i> | F | | | X | X | | 1,273 | |
| Willie Wagtail | <i>Rhipidura leucophrys</i> | Ag | | | X | X | | | Common around Karimui Station |
| Northern Fantail | <i>Rhipidura rufiventris</i> | F | | | X | X | | 1,423 | |
| Sooty Thicket Fantail | <i>Rhipidura threnothorax</i> | F | | | X | X | | 1,243 | |
| White-bellied Thicket Fantail | <i>Rhipidura leucothorax</i> | F | | | X | X | | | Seen once near Karimui Station |
| Black Fantail | <i>Rhipidura atra</i> | F | | | X | X | 1,241 | 2,520 | |
| Chestnut-bellied Fantail | <i>Rhipidura hyperythra</i> | F | | pair, low | X | X | | 1,658 | |

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|---------------------------------|--------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|--|
| Friendly Fantail | <i>Rhipidura albolimbata</i> | F | | pair, high | X | X | 1,633 | 2,520 | |
| Dimorphic Fantail | <i>Rhipidura brachyrhyncha</i> | F | | | X | X | 1,573 | 2,520 | |
| Rufous-backed Fantail | <i>Rhipidura rufidorsa</i> | F | | | | X | | | |
| Black Monarch | <i>Symposiachrus axillaris</i> | F | | | X | X | 1,188 | 1,913 | |
| Spot-winged Monarch | <i>Symposiachrus guttula</i> | F | | | X | X | | 1,183 | |
| Black-winged Monarch | <i>Monarcha frater</i> | F | | | X | X | | 1,623 | |
| Golden Monarch | <i>Carterornis chrysomela</i> | F | | | X | X | | 1,193 | |
| Frilled Monarch | <i>Arses telescopthalmus</i> | F | | | X | X | | 1,273 | |
| Torrent-lark | <i>Grallina bruijnii</i> | Aq | | | X | X | | 1,213 | |
| Grey Crow | <i>Corvus tristis</i> | F | | | X | X | | 1,233 | |
| Lesser Melampitta | <i>Melampitta lugubris</i> | F | | | X | | 1,943 | 2,520 | |
| Blue-capped Ifrit | <i>Ifrita kowaldi</i> | F | | | X | X | 1,793 | 2,356 | |
| Crinkle-collared Manucode | <i>Manucodia chalybatus</i> | F | | | X | X | | 1,433 | |
| Trumpet Manucode | <i>Phonygammus keraudrenii</i> | F | | | X | X | | 1,423 | |
| Short-tailed Paradigalla | <i>Paradigalla brevicauda</i> | F | | | X | X | | | Seen once at 1,820 m |
| Princess Stephanie's Astrapia | <i>Astrapia stephaniae</i> | F | | | X | X | 1,713 | 2,520 | |
| Lawes's Parotia | <i>Parotia lawesii</i> | F | | | X | X | | | Pair seen once at 1,640 m |
| King of Saxony Bird-of-paradise | <i>Pteridophora alberti</i> | F | | | X | X | 1,893 | 2,520 | |
| Superb Bird-of-paradise | <i>Lophorina superba</i> | F | | | X | X | 1,283 | 1,982 | |
| Magnificent Riflebird | <i>Ptiloris magnificus</i> | F | | | X | X | | 1,473 | |
| Black Sicklebill | <i>Epimachus fastosus</i> | F | VU | | X | X | 1,683 | 2,520 | |
| Black-billed Sicklebill | <i>Drepanornis albertsi</i> | F | | | X | X | | | One mist-netted at 1,710 m |
| Magnificent Bird-of-paradise | <i>Diphyllodes magnificus</i> | F | | | X | X | | 1,709 | |
| King Bird-of-paradise | <i>Cicinnurus regius</i> | F | | | X | X | | | Singles at Sena (730 m) and Tua (550 m) Rivers |
| Raggiana Bird-of-paradise | <i>Paradisaea raggiana</i> | F | | | X | X | | 1,623 | |
| Blue Bird-of-paradise | <i>Paradisaea rudolphi</i> | F | VU | | | X | | | |

| English name | Scientific name | Habitat | Conservation status | Elevational replacement | BGF/AMCF | Diamond | Lower limit (m) | Upper limit (m) | Notes |
|-------------------------|-----------------------------------|---------|---------------------|-------------------------|----------|---------|-----------------|-----------------|---|
| Banded Yellow Robin | <i>Poecilodryas placens</i> | F | NT | | | X | | | |
| Black-throated Robin | <i>Poecilodryas albonotata</i> | F | | | X | X | 1,703 | 2,520 | |
| White-winged Robin | <i>Peneothello sigillata</i> | F | | quartet, highest | X | X | 2,333 | 2,520 | |
| Slaty Robin | <i>Peneothello cyanus</i> | F | | quartet, high middle | X | X | 1,673 | 2,398 | |
| White-rumped Robin | <i>Peneothello bimaculata</i> | F | | quartet, lowest | X | X | | 1,283 | |
| White-faced Robin | <i>Tregellasia leucops</i> | F | | | X | X | 1,198 | 1,718 | |
| White-eyed Robin | <i>Pachycephalopsis poliosoma</i> | F | | quartet, low middle | X | X | 1,218 | 1,698 | |
| Torrent Flyrobin | <i>Monachella muelleriana</i> | F | | | X | X | | | Seen at Sena (730 m) and Tua (550 m) Rivers |
| Canary Flyrobin | <i>Microeca papuana</i> | F | | trio, high | X | X | 1,763 | 2,520 | |
| Yellow-legged Flyrobin | <i>Microeca griseiceps</i> | F | | trio, middle | X | | 1,093 | 1,423 | |
| Olive Flyrobin | <i>Microeca flavovirescens</i> | F | | trio, low | X | X | | 1,313 | |
| Garnet Robin | <i>Eugerygone rubra</i> | F | | | X | X | 1,753 | 2,333 | |
| Northern Scrub Robin | <i>Drymodes superciliaris</i> | F | | | X | X | | 1,393 | |
| Lesser Ground Robin | <i>Amalocichla incerta</i> | F | | | X | X | 1,794 | 2,105 | |
| Island Leaf Warbler | <i>Phylloscopus maforensis</i> | F | | | X | X | 1,321 | 1,961 | |
| Australian Reed Warbler | <i>Acrocephalus australis</i> | Ag | | | | X | | | Present around Karimui airstrip |
| Papuan Grassbird | <i>Megalurus macrurus</i> | Ag | | | | X | X | | Common around Karimui Station |
| Black-fronted White-eye | <i>Zosterops minor</i> | F | | | X | X | | 1,703 | |
| Singing Starling | <i>Aplonis cantoroides</i> | Ag | | | | X | | | Flock regular at Karimui airstrip |
| Yellow-faced Myna | <i>Mino dumontii</i> | F | | | X | X | | 1,353 | |
| Russet-tailed Thrush | <i>Zoothera heinei</i> | F | | | X | X | 1,473 | 1,643 | |
| Pied Bush Chat | <i>Saxicola caprata</i> | Ag | | | | X | | | |
| Red-capped Flowerpecker | <i>Dicaeum geelvinkianum</i> | F | | | X | X | | 1,723 | |
| Black Sunbird | <i>Leptocoma sericea</i> | Ag | | | | X | | | |
| Blue-faced Parrotfinch | <i>Erythrura trichroa</i> | F | | | X | X | 1,493 | 2,313 | |
| Streak-headed Mannikin | <i>Lonchura tristissima</i> | F | | | | X | | | Seen twice around Karimui Station |
| Hooded Mannikin | <i>Lonchura spectabilis</i> | Ag | | | | X | X | | Common around Karimui Station |