Birds of the Kaijende Highlands — The High Elevation Avifauna Revisited

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Chapter 17

Birds of the Kaijende Highlands – the high elevation avifauna revisited

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SUMMARY

We compare records of birds surveyed from a high elevation camp in the Kaijende Highlands in 2008 with a similar dataset collected in 2005. In both surveys a preponderance of species was recorded in four days of effort, but apparently local patchiness of species distribution led to single-site surveys missing common species. A take-home lesson is that rather than investing more days in a single camp, it may be more productive to move camp after four days of effort. In order to fully survey the impoverished avifauna at 3,200 meters elevation, it would be best to work at no fewer than three separate camps, which would give access to the entire avifauna. Earlier field work underestimated the high-elevation fauna, which we now estimate to be 60 resident species at 3,200 m. This higher count may, in part, be a product of upslope retreat of montane species in the face of ongoing climate change. We document seven species on the Kaijende Plateau that are substantially above their known elevational limits elsewhere.

INTRODUCTION

The massive Kaijende Plateau (see Richards 2007) is one of the most remarkable upland features of the central highlands of Papua New Guinea. Anything but planar, this vast upland surface includes a network of high-elevation grassland basins interdigitated with an array of rocky summit peaks that exceed 3,400 m in elevation. The Kaijende Highlands are stunningly beautiful and little-developed with but a single gravel road that, when completed, will provide direct access to this upland wilderness from Porgera (from the north) and Tari (from the south). There are considerable bushwalking and nature tourism opportunities here, once facilities are available to serve visitors.

Although this highlands region will be disturbed by the road access and ongoing pit mining for gold at Mount Kare, much of it will remain wilderness for the foreseeable future, because of difficulty of access. It is thus an important natural biotic reserve, especially under the current regime of global change.

The birdlife of the Kaijende Plateau has been studied on several occasions (see Beehler and Sine (2007) but remains incompletely known. This chapter reports on the birds of a single high-elevation camp, and compares the survey results of this 2008 field effort with that made in 2005 at a similar high camp a mere 5 kilometers distant. The comparison offers an interesting study on the accuracy and effectiveness of the RAP avian field survey methodology under the uncertainties of real-world field conditions.

STUDY SITE AND METHODS

The Kai-ingri Camp was established c. 200 m west of the gravel road being constructed to link Porgera with Tari to the south. The Camp was placed in a small copse of closed subalpine forest

atop a ridge trending northwest-southeast (05°34.442S, 143°02.896E). The road makes its way up a ravine to a pass on the ridge, which is the headwaters of two streams, one flowing northwestward, the other southeastward and then turning and flowing northwestward in a grassland valley to the south. Consensus GPS readings gave the Camp an elevation of 3,315 m.

Birds were surveyed as follows. The senior author conducted walking surveys ranging from the ridge-top pass near camp down the road to the north (toward the Waile Creek reservoir) and to the south, toward the next grassland valley. Birds were observed between 2,986 m and 3,320 m. This included a tall grove of *Phyllocladus hypophyllus*, various grassland patches, copses of forest, ericaceous shrublands and disturbed roadside habitat. Twenty mist-nets were deployed by the third author in forest and shrubbery adjacent to the Camp site over five days. Morning and afternoon walking censuses of birds were carried out thrice daily over seven days. In addition, *ad libitum* observations were recorded on day-sheets. Finally, members of the field team provided additional detailed descriptions of birds encountered in their daily field activities.

RESULTS AND DISCUSSION

Results of the seven days of avian survey are presented in Table 17.1 A total of 1,284 individuals of 51 species were recorded. Given that this camp surveyed essentially the same bird fauna as that surveyed at the Omyaka Camp (5°31'37"S, 143°03'23"E, 3,200 m), in 2005 it is useful to describe the results of the 2008 survey effort in light of the original 2005 work. A comparison of these results can be found in the rightmost five columns of Table 17.1 as well as in Table 17.2, which compares the 21 most common species from each survey.

The two field surveys differed in several ways that may, in part, explain the different results. The 2005 survey was the senior author's first field survey in the PNG highlands in more than a decade, so his memories of the vocalizations of the highland birds were undoubtedly somewhat depleted. Moreover, access to habitats surrounding the Omyaka Camp during 2005 was more restricted than that around Kai-ingri Camp in 2008. The former survey was restricted to local walking tracks and limited access provided by grassland patches. The 2008 survey benefited from the gravel road, which offered an excellent place to observe and listen for birds. The take-home point here is that access is critical, and the 2005 effort would have benefited from the planned development of one or more survey tracks rather than the random effort that transpired. Finally, the 2008 effort provided access to habitat as low as 2,986 meters, considerably lower than that during the 2005 work. For purposes of comparison, we compare the first five days of effort for both surveys.

Despite differences in search effort (see Beehler and Sine 2007), the two five-day surveys generated similar results - 42 species for 2005 and 51 species for 2008. The nine additional species recorded in 2008 (16% of the known avifauna of 55 species) can most likely be explained by (a) the benefits of experience gained in 2005, (b) better access to montane habitats, (c) the difficulty of sampling the rarest species, (d) possible patchiness of distribution of certain species, and (e) differences in avian activity related to annual seasonality or of longer-term climate cycles (e.g., ENSO). Thirty-eight species were recorded at both Kai-ingri and Omyaka after five days of effort during these surveys. This compares with Gregory and Johnston's (1993) record of 22 species from four days at a camp at 3,200 m (Dokfuma) in the Star Mountains, and 22 species from nine days of survey of alpine and subalpine habitats of Mount Scratchley (3,200-3,520 m) by Clapp (1984).

When looking at the most commonly encountered (= abundant) species (Table 17.2), the 21 species most commonly encountered in 2008 (based on summing all individuals counted) includes 14 of the species most commonly recorded in 2005. The two most commonly encountered species for 2005 and 2008 were the same – Belford's Melidectes (*Melidectes belfordi*) and Plum-faced Lorikeet (*Oreopsitacus arfaki*).

Missed species (2005 vs. 2008)

The 2005 survey missed 13 species seen in 2008: Dwarf Cassowary, Black-mantled Goshawk, New Guinea Harpy-Eagle, Rufous Woodcock, White-breasted Fruit-Dove, Rufous-throated Bronze-Cuckoo, Sooty Owl, Hooded Cuckoo-shrike, Canary Flycatcher, Black-breasted Boatbill, Regent Whistler, Black Sittella, and King of Saxony Bird of Paradise. For several species, this is at or near the upper limit of its range (cassowary, goshawk, eagle, cuckoo, boatbill, bird of paradise). Some may also be only seasonally present because of diet (cassowary, fruit-dove). One (the whistler) was missed inexplicably as it is typically common, vocal, easily netted, and known to occur to 3,650 m (Beehler et al. 1986). This inexplicable lapse might also apply to the cuckoo-shrike, which is vocal and bold, traveling in family groups and often visiting forest-edge.

The 2008 survey missed just four species seen in 2005: Spotted Marsh-Harrier, Pied Chat, Brown-breasted Gerygone, and Blue-faced Parrot-finch. Of these, the harrier is an uncommon grassland forager that may be patchy or just rare. The parrot-finch is known to be quite unpredictable, because of the nature of its bamboo seed diet (Diamond 1972). The chat is above its elevational limit here (Beehler et al. 1986). The gerygone is perhaps one of those inexplicable "misses" - a common and vocal species that is hard to overlook.

Is this the total highland avifauna? – what is missing altogether?

Perhaps of greater interest is what highland species were expected but absent (apparently overlooked?) by both surveys - and why? We can start answering this question by

examining the species lists provided by Clapp (1984) for Mount Scratchley and Gregory and Johnston (1993) for the Star Mountains. Remarkably, neither Clapp nor Gregory and Johnston recorded any species that might be expected in the Kaijende highlands on distributional grounds, but that was missed by us. The only species they recorded that we did not were species known not to occur in PNG's central highlands [two geographic "dropout" species noted by Diamond (1972) - Logrunner *Orthonyx temminckii* and Macgregor's Bird of Paradise *Macgregoria pulchra*]. A review of Beehler et al. (1986) suggests that the following species might be expected, on distributional and elevational grounds, in the Kaijende highlands above 3,000 m: Salvadori's Teal (*Salvadorina waigiuensus*), Forbes' Forest-Rail (*Rallicula forbesi*), Mountain Nightjar (*Eurostopodus archboldi*), Tit Berrypecker (*Oreocharis arfaki*), Archbold's Bowerbird (*Archboldia papuensis*), Macgregor's Bowerbird (*Amblyornis macgregoriae*), and Brown Sicklebill (*Epimachus meyeri*). That would give this upland avifauna a total of 55 + 7 species = 62 breeding resident species for the subalpine zone between 3,000-3,200 m. That is a substantially higher count than the plotted estimate of 50 species for 3,000 m provided by Beehler (1981: 846, Figure 3). The seven species listed above as "expected" include two species we know occur on the Kaijende Highlands (the teal and sicklebill). The rail is probably there - it is a species easily overlooked if it is not vocal. The nightjar is perhaps patchily distributed and not present. We certainly looked for it in the evenings without luck. The berrypecker is at its elevational limit and also is a nomadic frugivore- and thus easily missed. Macgregor's Bowerbird is also easily overlooked at this high elevation (it hides in deep forest interior). We would expect it on the Kaijende highlands.

That leaves Archbold's Bowerbird, the last bowerbird described to science and one of the marvelous upland endemics of the New Guinea central cordillera. It seems to be truly patchily distributed - present in some places (Mount Hagen massif, for instance) but absent elsewhere (Kaijende?). It is found to the west in Indonesian New Guinea and to the east at Mount Hagen, so why is it absent from the Kaijende Highlands? It perhaps qualifies as one of Diamond's (1972) drop-out species. But exactly why it drops out is not sufficiently clear, and is worthy of future study. Archbold's Bowerbird is certainly the big story in terms of absent species. It is a bit akin to the absence of Macgregor's Bird of Paradise (actually a honeyeater), found in subalpine highlands in western and eastern New Guinea but absent in the middle. One must assume these populations did exist here at one point, only to dwindle to zero at some point in the past. This pattern remains a curiosity that strikes at the heart of the biogeographic story of the bird fauna of New Guinea.

Effort and asymptote

Returning to our comparison of the 2005 and 2008 survey results, an examination of Figure 17.1 may be enlightening. Here we have merged the five-day survey of 2005 with the seven-day survey of 2008. Days 1-5 show a flattening of the species-accumulation curve in day five. The survey effort of 2005 seemed to reach a possible asymptote after a mere five days of effort. Adding the seven days of 2008 shows a further four days of species accumulation, followed by three days of no additional species – a fairly convincing asymptote. Two points may be drawn from this two-arc curve. First, the fact that the second survey quickly added thirteen additional species indicates local patchiness of distribution – some species are common and visible in some camps and rare or absent in other camps. Thus it is worth working at least two camps for every major habitat or elevational zone to get a full range of species. Species are not evenly distributed through the habitat and field survey methods need to recognize this fact.

Second, an effort of no more than seven days in two camps would have encountered all the species surveyed in twelve days. Thus, at an elevation above 3,000 m in central New Guinea, one should consider investing 7-10 days in order to encounter a substantial proportion of the expected bird species. Building on this notion, and returning to the share of the accumulation curve in Figure 17.1, we suggest that the best way to survey the greatest proportion of the montane avifauna in New Guinea would be to survey a minimum of three camps, spending 3-4 days at each camp, in order to get the job done. Studying a lowland rainforest in eastern New Guinea, Beehler et al. (1995) recommended three weeks of survey in order to record 90% of the local forest avifauna. Clearly the richer lowland rainforest avifauna requires substantially more effort than the rarified upland counterpart.

Evidence of climate change

It is now well-documented that species ranges are shifting upslope, probably in response to climate change. The 2005 and 2008 datasets include seven species that were recorded at least 100 meters above their known global elevational range (Table 17.3). These range from a 530 meter extension for the Black-throated Robin (*Pecilodryas albonotata*) to a 100 m elevational extension for the Black-mantled Goshawk (*Accipiter melanochlamys*). Although time-series data are not available

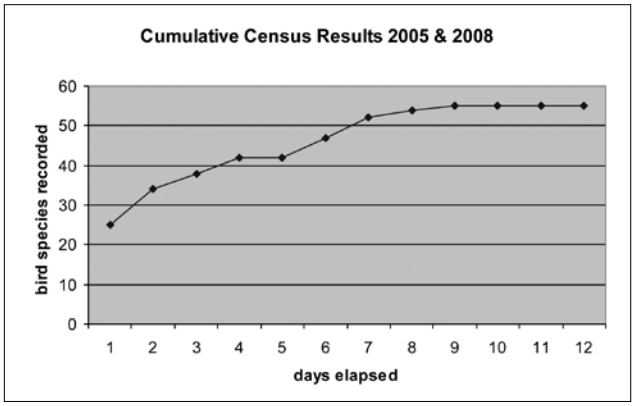

Figure 17.1. Species accumulation curve for birds recorded at Omyaka (days 1-5; 2005) and Kai-ingri (days 6-12; 2008).

Table 17.1. Summary of 2008 bird census list at Kai-ingri Camp, Kaijende Highlands with comparison to Omyaka Camp (2005).

Species		2008 Kai-ingri Camp Results									2008 vs. 2005				
		6 July 2008	7 July 2008	8 July 2008	9 July 2008	10 July 2008	11 July 2008	12 July 2008	cum. total count/ 7 days	cum. no. days recorded	Kai-ingri Camp 2008 5-day total	Omyaka Camp 2005 5-day total	Kai-ingri Camp 2008 no. days	Omyaka Camp 2005 no. days	species recorded both camps
Dwarf Cassowary	*Casuarius bennetti*	1							1	1	1	0	1	0	
Spotted Marsh Harrier	*Circus spilonotus*								0	0	0	1	0	1	
Black-mantled Goshawk	*Accipiter melanochlamys*	1							1	1	1	0	1	0	
New Guinea Harpy-Eagle	*Harpyopsis novaeguineae*		1				1	1	3	4	1		1	0	
Rufous Woodcock	*Scolopax saturata*	1	1	1	2	1	1		7	6	6		5	0	
Brown Quail	*Coturnix australis*			5				2	7	3	5	11	1	3	1
White-breasted Fruit-Dove	*Ptilinopus rivoli*	1							1	2	1		1	0	
Papuan Mountain Pigeon	*Gymnophaps albertisii*			15	20	13	h		48	5	48	9	3	2	1
Papuan Lorikeet	*Charmosyna papou*		1						1	2	1	25	1	5	1
Orange-billed Lorikeet	*Neopsittacus pullicauda*					1			1	2	1	11	1	3	1
Plum-faced Lorikeet	*Oreopsittacus arfaki*	15	20	20	30	20	15	5	125	7	105	88	5	5	1
Painted Tiger-Parrot	*Psittacella picta*	1	2	1	1	2	1	2	10	7	7	4	5	2	1
Fan-tailed Cuckoo	*Cacomantis flabelliformis*		1	1			2		4	4	2	1	2	1	1
Rufous-throated Bronze-Cuckoo	*Chrysococcyx ruficollis*	1	2	3	2	1	2	2	13	7	9		5	0	
Sooty Owl	*Tyto tenebricosa*			1					1	2	1		1	0	
Mountain Swiftlet	*Collocalia hirundinacea*	10	10	10	5	2	1		38	6	37	19	5	5	1
Glossy Swiftlet	*Collocalia esculenta*	20	20	20	30	20	20	10	140	7	110	22	5	5	1
Alpine Pipit	*Anthus gutturalis*			3					3	2	3	4	1	2	1
Hooded Cuckoo-shrike	*Coracina longicauda*		3		3	1	1		8	4	7		3	0	
Pied Chat	*Saxicola caprata*								0	0	0	7	0	4	
Island Thrush	*Turdus poliocephalus*	3	5	10	4	10	5	5	42	7	32	30	5	5	1
Lesser Melampitta	*Melampitta lugubris*	1	1	5	2	3	1	2	15	7	12	11	5	4	1

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Table 17.1. *continued*

Species		2008 Kai-ingri Camp Results									2008 vs. 2005				
		6 July 2008	7 July 2008	8 July 2008	9 July 2008	10 July 2008	11 July 2008	12 July 2008	cum. total count/ 7 days	cum. no. days recorded	Kai-ingri Camp 2008 5-day total	Omyaka Camp 2005 5-day total	Kai-ingri Camp 2008 no. days	Omyaka Camp 2005 no. days	species recorded both camps
Blue-capped Ifrita	*Ifrita kowaldi*	1	1	2	4	6	4	2	20	7	14	5	5	3	1
Tawny Grassbird	*Megalurus timoriensis*	4	10	5	10	5	5	4	43	7	34	42	5	5	1
Mountain Mouse-warbler	*Crateroscelis robusta*	3	3	3	5	5	4	3	26	7	19	12	5	5	1
Large Scrubwren	*Sericornis nouhuysi*	1	1	5	3	3	2	1	16	7	13	15	5	3	1
Papuan Scrubwren	*Sericornis papuensis*	1	2	3	8	5	5	3	27	7	19	3	5	2	1
New Guinea Thornbill	*Acanthiza murina*	1	8	10	5		4	4	32	6	24	3	4	1	1
Brown-breasted Gerygone	*Gerygone ruficollis*								0	0	0	9	0	4	
Dimorphic Fantail	*Rhipidura brachyrhyncha*	4	4	4	10	10	10	4	46	7	32	20	5	5	1
Friendly Fantail	*Rhipidura albolimbata*	1	2	5	4	4	4	4	24	7	16	13	5	5	1
Canary Flycatcher	*Microeca papuana*			1	1			1	3	3	2	0	2	0	
Garnet Robin	*Eugerygone rubra*	1							1	1	1	2	1	1	1
Mountain Robin	*Petroica bivittata*	1			4			2	7	3	5	4	2	2	1
Black-breasted Boatbill	*Machaerirhynchus nigripectus*	2	4	5	8	5	4	5	33	7	24	0	5	0	
Black-throated Robin	*Peocilodryas albonotata*				1				1	1	1	5	1	2	1
White-winged Robin	*Peneothello sigillatus*	1	2	3	3	4	5	4	22	7	13	25	5	5	1
Regent Whistler	*Pachycephala schlegelii*		1		1				2	2	2	0	2	0	
Brown-backed Whistler	*Pachycephala modesta*	3	3	1	2		1	1	11	6	9	10	4	4	1
Rufous-naped Whistler	*Pachycephala rufinucha*	5	5	5	5	8	6	6	40	7	28	17	5	5	1
Black Sittella	*Daphoenositta miranda*		5						5	1	5	0	1	0	
Fan-tailed Berrypecker	*Melanocharis versteri*	1			1			1	3	3	2	13	2	4	1
Crested Berrypecker	*Paramythia montium*	1	5	5	5	3	4	6	29	7	19	39	5	5	1
Red-collared Myzomela	*Myzomela rosenbergii*					1	1	1	3	3	1	4	1	3	1
Black-throated Honeyeater	*Lichenostomus subfrenatus*		1	1	1	1	1	1	6	6	4	35	4	5	1

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Table 17.1. *continued*

Species		2008 Kai-ingri Camp Results									2008 vs. 2005				
		6 July 2008	7 July 2008	8 July 2008	9 July 2008	10 July 2008	11 July 2008	12 July 2008	cum. total count/ 7 days	cum. no. days recorded	Kai-ingri Camp 2008 5-day total	Omyaka Camp 2005 5-day total	Kai-ingri Camp 2008 no. days	Omyaka Camp 2005 no. days	species recorded both camps
Grey-streaked Honeyeater	*Ptiloprora perstriata*	2	3	2	3	2	1	2	15	7	12	29	5	5	1
Sooty Melidectes	*Melidectes fuscus*	20	15	10	10	15	10	6	86	7	70	65	5	5	1
Long-bearded Melidectes	*Melidectes princeps*		1		1		1		3	3	2	11	2	3	1
Belford's Melidectes	*Melidectes belfordi*	30	30	30	40	25	20	30	205	7	155	173	5	5	1
Common Smoky Honeyeater	*Melipotes fumigatus*	5	10	10	10	8	6	5	54	7	43	62	5	5	1
Blue-faced Parrot-finch	*Erythrura trichroa*								0	0	0	3	0	2	
Mountain Firetail	*Oreostruthus fuliginosus*	1	5	5	3	2	1	2	19	7	16	3	5	3	1
Crested Bird of Paradise	*Cnemophilus macgregorii*	1			2	2		1	6	4	5	?	3	1	1
Ribbon-tailed Astrapia	*Astrapia mayeri*	5		4	3	4	3	3	22	6	16	9	4	5	1
King of Saxony Bird of Paradise	*Pteridophora alberti*		1	1		1	1	1	5	5	3	0	3	0	
Totals									**1284**		**999**	**874**			**38**
									7-day		5-day	5-day			Shared

Table 17.2. Most common birds at Kai-ingri (2008) vs. Omyaka (2005) Camps, Kaijende Highlands (5-day censuses).

Kai-ingri Camp (2008)			2008 Kai-ingri Camp 5-day Total count	2008 Kai-ingri Camp no. days	Omyaka Camp (2005)		2005 Omyaka Camp 5-day Total count	2005 Omyaka Camp no. days
1	Belford's Melidectes	*Melidectes belfordi*	95	5	Belford's Melidectes	*Melidectes belfordi*	173	5
2	Plum-faced Lorikeet	*Oreopsittacus arfaki*	70	5	Plum-faced Lorikeet	*Oreopsittacus arfaki*	88	5
3	Glossy Swiftlet	*Collocalia esculenta*	75	5	Sooty Melidectes	*Melidectes fuscus*	65	5
4	Papuan Mountain Pigeon	*Gymnophaps albertisii*	51	3	Common Smoky Honeyeater	*Melipotes fumigatus*	62	5
5	Sooty Melidectes	*Melidectes fuscus*	40	5	Tawny Grassbird	*Megalurus timoriensis*	42	5
6	Common Smoky Honeyeater	*Melipotes fumigatus*	33	5	Crested Berrypecker	*Paramythia montium*	39	5
7	Island Thrush	*Turdus poliocephalus*	29	5	Black-throated Honeyeater	*Lichenostomus subfrenatus*	35	5
8	Dimorphic Fantail	*Rhipidura brachyrhyncha*	29	5	Island Thrush	*Turdus poliocephalus*	30	5
9	Tawny Grassbird	*Megalurus timoriensis*	25	5	Grey-streaked Honeyeater	*Ptiloprora perstriata*	29	5
10	Black-breasted Boatbill	*Machaerirhynchus nigripectus*	23	5	Papuan Lorikeet	*Charmosyna papou*	25	5
11	Rufous-naped Whistler	*Pachycephala rufinucha*	23	5	White-winged Robin	*Peneothello sigillatus*	25	5
12	Mountain Swiftlet	*Collocalia hirundinacea*	22	5	Glossy Swiftlet	*Collocalia esculenta*	22	5
13	Papuan Scrubwren	*Sericornis papuensis*	21	5	Dimorphic Fantail	*Rhipidura brachyrhyncha*	20	5
14	New Guinea Thornbill	*Acanthiza murina*	19	4	Mountain Swiftlet	*Collocalia hirundinacea*	19	5
15	Mountain Mouse-warbler	*Crateroscelis robusta*	18	5	Rufous-naped Whistler	*Pachycephala rufinucha*	17	5
16	Friendly Fantail	*Rhipidura albolimbata*	18	5	Large Scrubwren	*Sericornis nouhuysi*	15	3
17	Crested Berrypecker	*Paramythia montium*	18	5	Friendly Fantail	*Rhipidura albolimbata*	13	5
18	Blue-capped Ifrita	*Ifrita kowaldi*	17	5	Fan-tailed Berrypecker	*Melanocharis versteri*	13	4
19	Large Scrubwren	*Sericornis nouhuysi*	16	5	Mountain Mouse-warbler	*Crateroscelis robusta*	12	5
20	Ribbon-tailed Astrapia	*Astrapia mayeri*	15	4	Brown Quail	*Coturnix australis*	11	3
21	Lesser Melampitta	*Melampitta lugubris*	15	5	Orange-billed Lorikeet	*Neopsittacus pullicauda*	11	3

Table 17.3. Up-slope movements of birds in the Kaijende Highlands.

Species		Beehler et al. 1986	Kaijende 2005/2008	Jump
Black-mantled Goshawk	*Accipiter melanochlamys*	3,100 m	3,320 m	100 m
Pied Chat	*Saxicola caprata*	2,850 m	3,200 m	350 m
Blue-capped Ifrita	*Ifrita kowaldi*	2,900 m	3,320 m	420 m
Black-breasted Boatbill	*Machaerirhynchus nigripectus*	3,000 m	3,320 m	320 m
Black-throated Robin	*Poecilodryas albonotata*	2,700 m	3,230 m	530 m
Blue-faced Parrot-finch	*Erythtura trichroa*	3,000 m	3,200 m	200 m
King of Saxony Bird of Paradise	*Ptteridophora alberti*	2,850 m	3,230 m	380 m

to show the upslope shift in range, we are comparing a local record from a short-term effort in the field against the cumulative data collected over two centuries of ornithological investigations in New Guinea, from all locations (Beehler et al. 1986). Finding substantial upslope range records is comparing a tiny dataset against an all-encompassing one. These are probably indicative of real upward movement over time. A similar pattern has been found along the YUS elevational transect in Morobe Province (Mandeville and Beehler, manuscript).

Species Accounts

Scolopax saturata Rufous Woodcock

At dusk at 1838 hrs this species carried out its display flight over a roadside grassy opening, giving its distinctive call *pshwet--- honk honk honk honk.* It repeated this performance four times in one evening. The last pass-over was at 1843 hrs. On 8 July, the first display flight was at 1841, the last at 1851.

Melidectes belfordi Belford's Melidectes

This abundant species is the first diurnal bird to vocalize in the morning. On 8, 9, and 11 July 2008, it gave the first vocalization at 0607 hrs.

Cnemophilus macgregorii Crested Satinbird

Twice observed adult males fly across the road, and once observed a female-plumaged bird foraging for canopy fruit in association with a Crested Berrypecker (*Paramythia montium*).

Pteridophora alberti King of Saxony Bird of Paradise

Heard a young bird giving its jeering call, and then saw an adult male fly across the road at 3,150 m, an elevational record.

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