

I believe that with more observation hours more species would have been recorded. Even with only four hours observation time, I believe the tree was used by at least one, possibly two, nesting female Raggiana Birds of Paradise. Raggiana Birds of Paradise were nesting in the park at the time of these observations. The tree was also visited by insectivorous species, though none of the birds that fed on the figs were seen to forage for insects.

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FEEDING BEHAVIOUR OF SACRED KINGFISHER *HALCYON SANCTA*.

ROGER K. HICKS

On 1 July 1990, at Jais Aben Resort, Madang Province, I watched two Sacred Kingfishers feeding. One of the birds had a more prominent white supercilium which allowed me to keep track of each bird, as they were not in view the whole time. My observations lasted from 11:35 to 12:49 (74 minutes) and only ended when both birds were disturbed by a party of people sitting under the tree from which they were hunting.

Both Sacred Kingfishers employed a "sit and wait" approach. They perched on the lower branches of a rain-tree, c. 8-10 m above the ground. They always perched in the shade, although they did not always use the same perch. At times they were within 3 m of each other although there appeared to be no intraspecific aggression. From their perch they dropped at an angle of between 30 and 45 degrees from the vertical. Six forays were to the ground, which was short grass. Two forays, by the same kingfisher, were into the foliage of a bush on the shoreline. Seven forays out of the nine observed resulted in prey being caught.

Sacred Kingfisher "A" was in view for 53 minutes. During this time it made five forays, all to the ground. All were successful although only three of the prey items were seen for long enough for me to identify them. They were a beetle, a small (c. 3 cm long) lizard and a grasshopper. The kingfisher returned to a perch, not necessarily the one from which it had dropped, to consume its prey. Each of the above prey items was banged against a branch a few times and turned around in the bill before being swallowed. The grasshopper and lizard were swallowed head-first. The other two prey items were small and swallowed too quickly for me to see them. On one occasion, when returning to a perch, kingfisher "A" landed near a Willie Wagtail *Rhidipura leucophrys* which chased it to another perch.

Sacred Kingfisher "B" was in view for 36 minutes. During this time it made four forays, two to the ground and two to the foliage of a bush. Only two were successful, one to the ground and one to the bush. On neither occasion could the prey be identified. It handled its prey much as kingfisher "A", returning to a perch, banging the prey against a branch and turning it around in its bill before swallowing.

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BIRD OBSERVATIONS IN LOWLAND MADANG PROVINCE

STEVEN F. BAILEY

INTRODUCTION

From 19 September to 1 December 1989 I was a resident Fellow at the Christensen Research Institute (CRI), 7 km due N of Madang at the Jais Aben Resort (JAR). My primary research was on the ecology of non-breeding terns. However during my CRI Fellowship I had the opportunity to bird watch in many nearby areas of lowland Madang Province. This paper summarises my observations, in a manner that I hope will be useful to future ornithological explorations of this region.

The seabirds were consistently counted during this period, and these more detailed results will be reported elsewhere. For completeness all species are included in the annotated list of this paper, but the status of seabirds is elaborated only for those birds seen from shore.

I found a total of 224 species. Selected observations by other ornithologists are also noted if appropriate data were available to me, but no species not found by me is reported in this paper. I know of many additional species of land-birds that formerly inhabited this region, and I expect that nearly all of them still occur there.

METHODS

Virtually all observations were made by me alone. Although local residents sometimes accompanied or guided me on my initial visit to a site, I almost invariably found more birds and more elusive birds by returning alone after obtaining the necessary permission. Typically this meant arriving at around dawn and slipping into the forest unseen. I believe only one species in Madang Province was shown to me by a local guide that I would have missed seeing by myself (Hook-billed Kingfisher). Undoubtedly, knowledgeable local guides can sometimes prove very helpful (e.g., Joseph Tano at Ambua Lodge, Tari), but few understand the aims of western birders and ornithologists, and I found that most local people disturbed or tried to kill the birds I was trying to observe.

Birds within several kilometres of CRI were mostly observed opportunistically or in the first two or three hours of the morning. The more distant sites (Naru areas, Malpain, Wasab) were usually birded from dawn to mid-day. On some days I entered the forest at dawn and remained there the entire morning, but often I birded the roadsides from dawn until the hot sunny weather decreased bird activity at forest edge and chased me into the forest. Walking/wading up rivers and streams was not very rewarding except for kingfishers. Occasional observations were made during the afternoon and evening hours. Night drives along the North Coast Road and night walks were all disappointing, probably reflecting the sterility

of plantation habitats for most nocturnal birds. The upper Ramu River valley was covered only once, because of the long drive necessary to get there.

My binocular was a Zeiss Dialyt 10x40B close-focus model. For roadside birding, and especially for watching fruiting trees, I relied heavily on my Bausch and Lomb 15-60x60 zoom scope. The mudflat and airport were censused by spotting scope. Other coastal and marine birds were mostly surveyed from a motor skiff, during which I occasionally travelled as far as Karkar Island (without landing) and up to 38 km offshore ENE of CRI.

SITES

As the Christensen Research Institutes was my base, and it or the Jais Aben Resort are likely bases for future workers, I give site directions from CRI. All distances in these directions are road kilometres. A map of these sites is given on page 135.

CHRISTENSEN RESEARCH INSTITUTE and VICINITY. The CRI/JAR grounds are mostly lawn with coconut palms. The roadsides out to the North Coast Road from CRI north to Militat Harbour and thence west to the North Coast Road provide more diverse habitats, albeit mostly quite disturbed ones. Bamboo and tall grass patches, small mangrove edges, and remnant native trees are among the plantations and habitations.

BAITABAG and NOBANOB. Along the North Coast Road either side of the JAR turnoff are extensive areas of tall moist grass. One of the best is by the Baitabag School, 1 km north on the west side of the road. Just north of the school is the road leading uphill to the Baitabag Mission. About 1.5 km south of the turnoff is the road up Mount Hanseman to the Nobanob Mission. Both Baitabag and Nobanob are heavily populated and disturbed, with only very small pockets of "natural" habitats for forest birds. As true forest birds are almost absent, and it is difficult to observe birds in these areas without being followed by large crowds of people, I visited them only five times for a total of eight hours.

ALEXISHAFEN POND. The smaller pond in Alexishafen is good for freshwater birds, but the larger pond across the street never had a single waterbird in my visits. Perhaps it has a very efficient and scary crocodile? Most of the smaller pond was screened from view by tall thick reeds, with only one or two gaps allowing partial viewing. Alexishafen is 9.2 km from CRI, 6.3 km north along the paved North Coast Road. Keep right where the paved road curves left, keep left entering town, and the smaller pond is on the left. I visited five times for a total of four hours. My one dawn visit produced more birds than my four noon visits, but no additional species.

MALPAIN. A very small village 2.5 km up the road to Baiteta. The Baiteta turnoff is at the south side of a bridge about 14 km north of the Alexishafen turnoff on the North Coast Road. Tracks lead into forest patches on both sides of the road just east of Malpain. These

patches retain most of the true forest birds. A large fruiting tree on the S side of the road was good throughout the period. This tree hosted up to 450 fruit-doves and pigeons of nine species, plus other frugivores. My six visits totalled 28 hours.

WASAB. The turnoff for this active logging area is about 37.3 km from CRI, 6.7 km north of The Malolo of Madang on the North Coast Road. On the right side of the Wasab access road at 1.8 km is a side road on which the logging was halted by the local village. Walking this side road was excellent forest-edge birding, but its potential for forest-interior birds seemed limited. The logging continues every day except Sunday, from 0700 to 1700. This activity plus the resulting mud and slash make the logging zone undesirable for bird observation at most times. However, on a Sunday morning after several consecutive dry days one can drive right to the cutting zone and walk right into the newly exposed forest, without any people or disturbance at that time. Despite this I did not see any birds here that were any more accessible than in the undisturbed forest areas, with the exception of a Dwarf Kingfisher that was flying back and forth across the logging road. I totalled 18 hours in four visits.

NARU HILLS. The Madang-Lae road crosses the foothill of the western end of the Finisterre Mountains. About four ridges into the hills from the Madang side, the road crosses the Naru River on a log one-lane bridge at the village of Naru. The high ridgetops on both sides of the Naru River were excellent for roadside birding. The forest south-east of the road on the ridgetop on the Madang side of Naru was the best, least-disturbed forest I visited in lowland Madang Province. The relatively low levels of human disturbance were exemplified by the Northern Cassowary, Vulturine Parrots, Palm Cockatoos, common Blyth's Hornbills, and abundant Sulphur-crested Cockatoos that I found there. The elevation of this ridgetop is 500-600 m. I was directed to this site by the notes of Tony Palliser (1989). I visited seven times and 42 hours.

SOUTH NARU. This is the only area of good flat lowland forest I worked, as the above three sites are all hilly. The forest patches and streams that I visited are 4.3 to 7.5 km south of the Madang-Lae road on a side road that is 7.3 km south-west of the Gogol River bridge, and 35.5 km south-south-west of CRI. Results at South Naru were quite variable, especially within the forest. My 29 hours were spread among five visits.

UTU and BAKU. These sites up the Gogol River Valley were visited once, for five hours during the middle of 21 October. They offer tiny remnants and edges of lowland forest regrowth, with some real forest patches visible on distant hills.

RAMU VALLEY. Part of the upper Ramu River Valley is in a rain shadow of the Finisterre Mountains, so there is an area of savanna and grassland. Although it is relatively small and is partly taken over by large sugar plantations and cattle ranches, it is the only area of these drier habitats in lowland Madang Province. Of course the avifaunas of these habitats are

quite distinct from anything around the wet Madang coast. My one visit was a very long day, with a 0200 awakening, a long drive to arrive at dawn (0550), nine hours of birding and a return to CRI at 1730. Once entering the Ramu Valley floor, the first area is a settled region of former forest. The transition to true savanna is abrupt, and this is followed by open grassland. The Ramu Sugar plantation is as far as I went. All four of these habitats had birds that I did not see in any of the others.

Tab Island. Also called (Big) Pig Island, Tab Island is the outermost of the Madang barrier reef islands. It is uninhabited, but partly gardened. I landed on Tab Island three times (6.5 hours), from a small motor skiff.

Meiro mudflat. The only mudflat in the Madang region is a very small one that has formed at the mouth of the Meiro River about 1 km northwest of the Madang Harbour. Mud is only exposed during the lower half of the tidal cycle; at other times the waters lap into the fringing mangroves. Terns roost on the mud when it is exposed but when the tide floods they shift to the dead trees and limbs grounded on the mudflat. Most waders apparently fly to the Madang Airport (1 km south) when the mud is submerged. I censused the waders on 13 October and 8 November, a total of five hours, and visited briefly for the terns several times.

Madang airport. Apparently the high tide roost site for most waders, the airport is also used by several species (especially plovers and curlews) as a foraging ground at any time. Without having permission to enter the airport grounds, I 'scoped from behind the south fence and checked the adjacent fields. My four visits (13 Oct to 2 Nov) were each of about one hour, and both high and low tides were sampled.

Gogol River mouth. This sandy river mouth was surveyed by motor boat on 11 October and 17 November. It was used by many terns as a day roost.

ANNOTATED SPECIES LIST

This list follows the sequence and nomenclature of 'Birds of New Guinea' (Beehler *et al.* 1986). Occasionally I give my preferred alternative name in parentheses, in some cases because the use of unmodified group names for species can be ambiguous.

Northern Cassowary

Casuarius unappendiculatus

21 Nov, an adult with full head and neck colours walked into view within the best Naru Hills forest. I had been standing quietly in a gully for perhaps 10 mins, watching a mixed flock of passerines. The "muruk" stepped around the shoulder of a small spur of the gully, saw me standing 8 m from it, spun about, and crashed away into the underbrush in apparant terror. Its reaction to me was so quick that it was in view only about 1.5 seconds. This so startled me that for a brief moment my heart froze and I thought that a terrible-looking painted warrior was confronting me, but of course the cassowary's fear was more justified. I estimated that it stood 1.4 m tall.

Tahiti Petrel

Uncommon offshore.

Pterodroma rostrata

Streaked Shearwater

Uncommon offshore.

Calonectris leucomelas

Wedge-tailed Shearwater

Common offshore.

Puffinus pacificus

Flesh-footed Shearwater

Rare offshore.

Puffinus carneipes

Heinroth's Shearwater

Uncommon outside the barrier reef, rare inside the reef.

Puffinus heinrothi

Australasian Grebe

Regular on the Alexishafen Pond, with up to 3 or 4 visible per visit. See next species.

Tachybaptus novaehollandiae

Little Grebe

Regular on the Alexishafen pond, with 1 or 2 visible on most visits. Interestingly, these congeneric grebes were seen together on most visits to this pond. Although all individuals of both species were in alternate plumage, I could see no nests through the tiny viewing gaps in the reeds.

Tachybaptus ruficollis

Lesser Frigatebird

1 or 2 occasionally seen soaring over nearshore waters, especially over tuna/tern feeding frenzies.

Fregata ariel

Little Black Cormorant

12 Oct, at dawn 19 landed in a tree by the Alexishafen Pond. Sometimes 1 was seen on the pond at mid-day. Occasionally 1 flew over the harbour waters by CRI or Madang. 22 Oct, a flock of 16 flew north past CRI.

Phalacrocorax sulcirostris

Little Pied Cormorant

8 arrived at dawn with the above flock of Little Black Cormorants, and 1 or 2 were often on the pond at mid-day.

Phalacrocorax melanoleucos

Brown Booby

Common offshore and uncommon nearer to shore.

Sula leucogaster

Great Egret

At Meiro mudflat 8 to 12 foraged until the water became deep. Up to 2 foraged in the Madang airport grass, and 1 to 3 were seen on the Ramu and Naru rivers.

Egretta alba

Intermediate Egret

16 Oct, 2 foraging in Madang airport grass; 11 Oct, 1 with Great Egrets at Meiro mudflat.

Egretta intermedia

Little Egret

1 or 2 per visit foraged at Meiro mudflat; 17 Oct, 1 at the Gogol River mouth.

Egretta garzetta

- Eastern Reef Egret *Egretta sacra*
Twice a single dark morph flew past CRI over the harbour waters.
- Crested Hawk *Aviceda subcristata*
Wasab (display flights seen), near Utu, and in the Ramu Valley. Reported by others at Naru and Baiteta, so apparently widespread.
- Long-tailed Buzzard *Henicopernis longicauda*
Naru Hills and South Naru. By others at Baiteta.
- Black-winged Kite *Elanus caeruleus*
2 in the Ramu Valley, at trees in grassland/savanna ecotone and canefield edge.
- Black Kite *Milvus migrans*
Common to abundant along roads, especially through opened country. They usually scavenged road-kills, but groups also hunted within the smoke of grassfires. 3 Nov, 66+ soaring over coconut trees across Nagada Harbour from CRI, catching and eating flying insects.
- Whistling Kite *Haliastur spheurnurus*
Uncommon but widespread. Usually single birds
- Brahminy Kite *Haliastur indus*
Common and conspicuous, but not abundant, with 1 to 5 individuals seen on most trips to every site, except the Ramu Valley.
- Spotted Marsh-Harrier *Circus spilonotus*
4 Nov, 1 cruising over ploughed Ramu Sugar canefields.
- Grey Goshawk *Accipiter novaehollandiae*
Fairly often at the sites with real forest.
- Grey-headed Goshawk *Accipiter poiliocephalus*
1 perched at forest edge at Wasab. Reported at Baiteta by John Woinarski.
- Collared Sparrowhawk *Accipiter cirrhocephalus*
This smallest *Accipiter* in New Guinea was the only one seen in the more disturbed areas such as around CRI and Baitabag; also at Malpain and Wasab, but not at either Naru area.
- New Guinea Harpy-Eagle *Harpyopsis novaeguineae*
29 Nov, 1 flushed and heard at Malpain, in disturbed forest north of the road.
- Gurney's Eagle *Aquila gurneyi*
22 Oct, 1 soaring over South Naru forest; 4 Nov, 1 soaring over Ramu Valley grassland. Woinarski reported it at Baiteta.
- Brown Falcon *Falco berigora*
4 Nov, 3 in the Ramu Valley included a pair at the savanna/grassland ecotone and one in a ploughed canefield. 26 Nov, 2 at Wasab. The PNGBS reported it at South Naru.

- Oriental Hobby *Falco severus*
30 Sep, a pair in display flight on the ridge-top west of the Naru River; 3 Nov, 1 flew past Baitabag. Woinarski reported it at Baiteta.
- Spotted Whistling-Duck *Dendrocygna guttata*
Numerous at Alexishafen Pond, with 15 to 45+ seen per visit; 8 Oct, a flock of 3 flew overhead 2 km north of CRI.
- Wandering Whistling-Duck *Dendrocygna arcuata*
26 Sep, 40 on Alexishafen Pond; decreasing numbers thereafter; 12 Nov, none.
- White-headed Shelduck *Tadorna radja*
13 Oct, 3 flushed from the mangroves behind the Meiro mudflat.
- Green Pygmy-Goose *Nettapus pulchellus*
A male-female pair was visible on the Alexishafen Pond on most visits and probably resided there throughout the period. Neither Coates (1985) nor Beehler *et al.* (1986) indicate any records from the northern watershed of New Guinea, but Jared Diamond and Paul Ehrlich recorded it on Alexishafen Pond in 1986.
- Pacific Black Duck *Anas superciliosa*
Small numbers (1 to 3) were seen at many localities including Alexishafen Pond, various rivers, and puddles in the clearcut area of Wasab.
- Common Scrubfowl *Megapodius freycinet*
Common on Tab Island, where I flushed 4 and located 6 mounds in a partial survey. I did not encounter this species on the mainland of Madang Province, but Luis Baptista reported it 2 km northwest of CRI and Woinarski listed it for Baiteta.
- Brown-collared Brush-Turkey *Talegalla jobiensis*
I heard this bird's raucous nasal crowing frequently, almost every time I visited the forest, yet I was never able to see one by any stealth or trickery. There was seldom an hour when I did not hear it at Naru Hills, Malpain, and parts of Wasab, but it was heard less often at South Naru and Utu. I found mounds in the Naru Hills forest, but no brush-turkeys came while I waited nearby.
- Buff-banded Rail *Rallus philippensis*
Easily seen in the early morning crossing the North Coast Road and opening between Baitabag School and the Nobanob road. Rails glimpsed crossing several other roads were probably this species.
- White-Browed Crane *Porzana cinerea*
Common at Alexishafen Pond, up to 10 in a visit. Occasionally seen crossing the North Coast Road at dawn in the same areas as Buff-banded Rail.

- Bush-Hen *Amaurornis olivaceus*
Often heard calling loudly, usually in morning duets, from many areas of tall grass. Seemed especially common between the JAR gate and the Baitabag School, but I only saw them by waiting for calling birds to cross roads at dawn. Also heard at Malpain and along the Madang-Lae Road near South Naru.
- Purple Swamphen *Porphyrio porphyrio*
4 Nov, 2 were alongside the road through the Ramu Valley, in grassland and canefield.
- Comb-crested Jacana *Irediparra gallinacea*
Common at Alexishafen Pond, up to 6 or 8 in a visit. Baptista reported them on the lily pond in Madang.
- Masked Lapwing *Vanellus miles*
4 Nov, 1 group of 44 around a pair of cattle ponds in the Ramu Valley.
- Lesser Golden Plover *Pluvialis dominica*
I prefer to consider this form a full species, as is the current trend. This was the most numerous wader in the Madang area. Counts on the Meiro mudflat were 230 on 13 Oct and 57+ on 8 Nov. During a morning low tide on 2 Nov I counted 70 foraging on the mowed grass of the Madang airport. During the afternoon high tide there were 148, of which about 100 were roosting in a flock and the rest were foraging. Lesser numbers were on the airport during each other visit. The patterns of most waders foraging on Meiro mudflat at low tide but moving onto Madang airport at high tide, but some individuals remaining on the airport through even low tide, held for most of the following wader species. A flock of 13 foraged the short grass around the Baitabag School on 27 Nov.
- Little Ringed Plover *Charadrius dubius*
Resident on all the larger, gravelly rivers (e.g., Naru, Gogol, and Ramu), this plover was frequently flushed from the road at or near bridges or fords, usually at dawn.
- Mongolian Plover *Charadrius mongolus*
Meiro mudflat had 11 and 12+ on my 2 counts. Madang Airport hosted up to at least 8 on a high tide, with fewer present on low tide.
- Large Sand-Plover *Charadrius leschenaultii*
Meiro mudflat counts were 3 and 7, with up to 5 found on the airport on high tide, and usually 2 on low tide. Both sand-plovers consistently occurred together, but this species was always in the minority.
- Eastern Curlew *Numenius madagascariensis*
1 to 3 consistently foraged on Meiro mudflat and Madang airport.

- Whimbrel *Numenius phaeopus*
1 or 2 usually on the mudflat and/or airport. 1 frequently foraging on the lawns of JAR, and singles flew past over the harbour. 14 Oct, 4 roosting on mangrove limbs in the Mis Estuary.
- Little Curlew *Numenius minutus*
13 Oct, 3 or 4 foraged in the short grass of Madang airport; 2 Nov, 1 there. All showed no movement with the tide.
- Grey-tailed Tattler *Tringa brevipes*
Up to 7 on Meiro mudflat. Occasionally seen flying over harbour waters.
- Common Sandpiper *Tringa terek*
1 to 3 on Meiro mudflat. 2 Nov, 2 fed in rain puddles at Madang airport during high tide.
- Black-tailed Godwit *Limosa limosa*
2 Nov, 1 in basic plumage fed in rain puddles on the airport throughout the day.
- Bar-tailed Godwit *Limosa lapponica*
2 Nov, 1 in juvenile plumage fed in rain puddles on the airport throughout the day. Thus, both godwits failed to use the mudflat during low tide.
- Sharp-tailed Sandpiper *Calidris acuminata*
13 Oct, 2 juveniles on Meiro mudflat; 2 Nov, up to 5 juveniles on the airport.
- Red-necked Stint *Calidris ruficollis*
13 Oct, a basic plumaged adult on Meiro mudflat; 8 Nov, a juvenile there.
- Red-necked Phalarope *Phalaropus lobatus*
Common offshore during the northern hemisphere winter.
- Arctic Skua *Stercorarius parasiticus*
Uncommon offshore.
- Pomarine Skua *Stercorarius pomarinus*
Uncommon offshore.
- White-winged Black Tern *Chlidonias leucopterus*
Seen only during the autumn migration period 8 Oct to 3 Nov, with the first individual being 3 days later than the earliest PNG record listed by Coates (1985). Usually near shore, with only 1 to 4 per day except for 60 on 11 Oct.
- Common Tern *Sterna hirundo*
The abundant and ubiquitous tern in Madang waters. My peak count in waters off CRI was 1600 on 7 Nov. The 2 counts at and near the Gogol River mouth roost revealed nearly 1900 on 11 Oct but only 180 on 17 Nov. Up to 73 roosting at the Meiro mudflat, mostly at low tide.

- Sooty Tern *Sterna fuscata*
Very rarely visible from shore, but common far offshore.
- Bridled Tern *Sterna anaethetus*
Drawn within sight from shore by tuna feeding near shore, but usually numerous only offshore.
- Grey-backed Tern *Sterna lunata*
Uncommon far offshore.
- Little Tern *Sterna albifrons*
Consistently common close to shore, but seldom more than 25 per day. However, numbers at and around roost sites were larger: up to 33 at Meiro mudflat and up to 240 at the Gogol River mouth.
- Crested Tern *Sterna bergii*
Sometimes visible from shore, usually while roosting on floating logs, but more common farther out. 17 Nov, 45 at the Gogol River mouth roost.
- Lesser Crested Tern *Sterna begalensis*
Only once or twice visible within view from shore, roosting on logs. Very scarce during my study.
- Brown Noddy *Anous stolidus*
Single Brown Noddies occasionally visible from shore, either over a tuna feeding frenzy or roosting on the platform of the Rasch Pass triangle marker. They were uncommon farther offshore.
- Black Noddy *Anous minutus*
Up to 35 roosted on the Rasch Pass triangle marker or rafted on the water beside it. These Black Noddies quickly joined any tuna feeding frenzies within or near the barrier reef. 11 Oct, 16 roosted on the beach at the Gogol River mouth. Also fairly common offshore.
- Brown Cuckoo-Dove *Macropygia amboinensis*
Encountered infrequently at Naru Hills, South Naru, and Wasab.
- Black-billed Cuckoo-Dove *Macropygia nigrirostris*
Only at Naru Hills, but Woinarski reported it at Baiteta.
- Great Cuckoo-Dove *Reinwardtoena reinwardtsi*
Occasionally flew by at Naru Hills, South Naru, Wasab, and near CRI.
- Emerald Ground-Dove *Chalcophaps indica*
At virtually all sites, except Naru Hills.
- Stephan's Ground-Dove *Chalcophaps stephani*
Only at the 4 sites with good forest: Naru Hills, South Naru, Malpain, and Wasab.

- Peaceful Dove *Geopelia striata*
Only in the drier Ramu Valley, where common.
- Cinnamon Ground-Dove *Gallicolumba rufigula*
Flushed once at South Naru. Reported by Woinarski at Baiteta.
- Pheasant Pigeon *Otidiphaps nobilis*
Heard at Naru Hills and South Naru, and flushed once at the former.
- Wompoo Fruit-Dove *Ptilinopus magnificus*
Common at the 4 forest sites. Rare near CRI.
- Pink-spotted Fruit-Dove *Ptilinopus perlatus*
Small numbers at the Malpain fruiting tree and Naru Hills.
- Ornate Fruit-Dove *Ptilinopus ornatus*
Common at the Malpain fruiting tree. Uncommon at Naru Hills, near CRI, and probably at Baitabag.
- Superb Fruit-Dove *Ptilinopus superbus*
Fairly common at Malpain, including the fruiting tree. Uncommon at Naru Hills. Reported at Baiteta by Woinarski.
- Coroneted Fruit-Dove *Ptilinopus coronulatus*
Found near CRI and at Malpain, including the fruiting tree.
- Beautiful Fruit-Dove *Ptilinopus pulchellus*
Small numbers at fruiting trees at Malpain, Wasab, and South Naru.
- Orange-billed Fruit-Dove *Ptilinopus iozonus*
Abundant everywhere except in the drier Ramu Valley, where I did not find it. Common even on Tab Island. 12 Oct, over 400 in and around the Malpain fruiting tree; up to 500 there on other days.
- Dwarf Fruit-Dove *Ptilinopus nanus*
Heard infrequently at South Naru and Naru Hills, but never seen.
- Purple-tailed Imperial Pigeon *Ducula rufigastrea*
Small numbers heard and seen (with difficulty) within the forests of Naru Hills, South Naru, and Malpain.
- Pinon Imperial Pigeon *Ducula pinon*
Very common and conspicuous at Wasab. Less common at the Malpain fruiting tree, at South Naru, and at remnant forest trees in the Ramu Valley.
- Zoe Imperial Pigeon *Ducula zoeae*
Heard fairly often but in very small numbers at all good forest sites plus forest remnants at Utu and the Ramu Valley. Seen infrequently.

- Pied Imperial Pigeon *Ducula bicolor*
4 Nov, about 30 in the Ramu Valley, where it was conspicuous throughout the savanna and along the river.
- Papuan Mountain Pigeon *Gymnophaps albertisii*
Common throughout both hills and plains except the drier Ramu Valley. Very conspicuous flying overhead in flocks, less obvious and silent within the forest. Even visited offshore Tab Island to forage.
- Dusky Lory *Pseudeos fuscata*
At most sites, usually overhead during long flights, but nowhere numerous.
- Rainbow Lorikeet *Trichoglossus haematodus*
Common in edge habitats, less common in almost all other areas, but I saw no lorikeets or lories in the drier Ramu Valley.
- Western Black-capped Lory *Lorius lory*
Common at Baitabag, South Naru, and along the Naru River. Less common at almost all other sites.
- Palm Cockatoo *Probosciger aterrimus*
Up to 3 in the Naru Hills forest; singles at Wasab and in the Ramu Valley savanna.
- Sulphur-crested Cockatoo *Cacatua galerita*
Abundant in the Ramu Valley savanna and in the Naru Hills, where 30 on and beside a distant cliff were suspected of eating minerals from the cliff face. Much less common in other forest areas, but frequently seen.
- Buff-faced Pygmy-Parrot *Micropsitta pusio*
Common in small flocks at Malpain. Probably glimpsed in flight at Baitabag Mission. Reported just outside CRI/JAR by Baptista and at Wasab by the San Diego Zoo.
- Double-eyed Fig-Parrot *Cyclopsitta diophthalma*
Mostly in pairs, at South Naru, Naru Hills, and probably near Utu.
- Edwards' Fig-Parrot *Psittaculirostris edwardsii*
6 Nov, 1 male at Wasab. Reported at Baiteta by Woinarski.
- Red-cheeked Parrot *Geoffroyus geoffroyi*
Conspicuous in small numbers, usually calling in flight. Almost everywhere except the drier Ramu Valley habitats, but most common at Naru Hills, South Naru, and Wasab.
- Eclectus Parrot *Eclectus roratus*
In all forest and most forest remnant sites, but most sightings were of single males calling conspicuously in flight. More common in Naru Hills.

- Vulturine Parrot *Psitttrichas fulgidus*
Single individuals seen in flight at Naru Hills, one on each high ridgetop flanking the Naru River. Reported at Wasab by the PNGBS.
- Oriental Cuckoo *Cuculus saturatus*
24 Oct, 1 or 2 near South Naru; 6 Nov, 1 at Wasab; 26 Nov, 1 at Wasab.
- Brush Cuckoo *Cacomantis variolosus*
Heard fairly often and less frequently seen almost everywhere.
- Chestnut-breasted Cuckoo *Cacomantis castaneiventris*
Twice in the Naru Hills I stalked and attracted a calling pair to my imitation, but I never saw them. Woinarski reported it at Baiteta.
- White-crowned Koel *Caliachthrus leucolophus*
Rarely seen in forest edge at Naru Hills and Wasab, but never seen clearly.
- Dwarf Koel *Microdynamys parva*
Uncommonly heard and rarely seen at all 4 good forest sites, plus Baitabag.
- Common Koel *Eudynamys scolopacea*
20 Nov, 1 female on Tab Island.
- Channel-billed Cuckoo *Scythrops novaehollandiae*
12 Oct, a flock of 5 calling in flight was pursued by a Grey Crow over Malpain.
- Lesser Black Coucal *Centropus bernsteini*
Numerous in the sugar cane and tall grassland of the Ramu Valley. Seen flying into very tall grasses along roadsides throughout the coastal plain and hills, and in the reeds at the Alexishafen ponds.
- Barn Owl *Tyto alba*
24 Sep, 1 perched over the North Coast Road 24 km north of the JAR turnoff was the only bird seen on the night drive.
- Papuan Nightjar *Eurostopodus papuensis*
5-27 Oct, 1 regularly flushed from the ground behind a fallen log in the Malpain forest but I could never find eggs; 27 Oct, 2 individuals flushed together from the same spot, with 1 there later that morning.
- Large-tailed Nightjar *Caprimulgus macrurus*
11 Nov, 1 flew in front of my vehicle, crossing the Madang-Lae Road near the Balek Reserve at 0523.
- Moustached Tree-Swift *Hemiprocne mystacea*
Adundant on the power transmission wires along the Madang-Lae Road through the Gogol Valley and Naru Hills, with up to 50 seen per trip. Also at forest edge of most other sites.

- Uniform Swiftlet *Collocalia vanikorensis*
Throughout the region, but apparently more common on the coastal plain (e.g., CRI and South Naru).
- Three-toed Swiftlet (?) *Collocalia papuensis*
This identification should be considered tentative. These swiftlets were noticeably larger, longer-tailed, and paler-throated than the Uniform Swiftlets. Up to 10+ were seen at Baitabag, plus 1 or more were between CRI and near Malpain. Thus, whatever this species, I only saw it at or near the edge of the lower coastal hills.
- Glossy Swiftlet *Collocalia esculenta*
Common foraging just above the road at Naru Hills and South Naru. Also at Malpain, Utu, and elsewhere.
- White-throated Needletail *Hirundapus caudacutus*
6 Nov, 1 at Wasab, first arrival; 18 Nov, 18 in 90 minutes of casual watching near CRI. Fairly common overhead anywhere near the coast after 6 Nov. Strangely, virtually every individual was flying north. Could this species migration follow the south side of New Guinea to such an extent that most visitors to Madang Province arrive there by flying around the east end of New Guinea?
- Common Paradise-Kingfisher *Tanysiptera galatea*
Common heard and infrequently seen in all 4 good forest areas. Also heard at Baitabag.
- Hook-billed Kingfisher *Melidora macrorrhina*
22 Oct, 1 female perched 7 m up in South Naru forest. Heard at Naru Hills by Palliser (1989).
- Rufous-bellied Kingfisher *Dacelo gaudichaud*
Common everywhere with forest or groves of trees. Heard often.
- Forest Kingfisher *Halcyon macleayii*
Common and conspicuous everywhere habitats are sufficiently open, except only 1 seen in the Ramu Valley, at Dumpu. 21 Oct, a somewhat melanistic individual was mated to a normal bird near Utu.
- Sacred Kingfisher *Halcyon sancta*
Common around CRI, rarely seen elsewhere. Coates (1985) states "... (many localities being vacated in early October) with a few birds lingering in southern areas until mid November. Odd birds rarely remain throughout the year." Although this species became rare around CRI in Oct, in Nov I watched a pair of Sacred Kingfishers displaying to each other quietly (17 Nov) and violently (25 Nov). Whether these displays were courtship or territorial, they raise the possibility that there was an intent to breed locally.

- Beach Kingfisher *Halcyon saurophaga*
True to its name, this species was fairly common on the barrier islands and some mainland shores. It was very difficult to approach. Beginning 23 Oct, 1 or 2 calling birds often cruised the CRI/JAR grounds early and/or late in the day.
- Yellow-billed Kingfisher *Halcyon torotoro*
Heard and rarely seen at Malpain, Naru Hills, and Wasab, the 3 sites of hilly forest.
- Dwarf Kingfisher *Ceyx lepidus*
Infrequently heard and rarely seen at Wasab, Naru Hills, and South Naru. 12 Nov, at Wasab a calling bird repeatedly flew across the end of a logging road in the active felling zone. Perhaps this was a distress reaction to the disembowelment of its home.
- Azure Kingfisher *Alcedo azurea*
Seen and heard in small numbers at all 4 forest sites and near Utu. Reported near CRI by the PNGBS.
- Common Kingfisher *Alcedo atthis*
9 Oct, 1 found by wading up the Naru River; 23 Nov, 1 at Tapo Creek at first light was probably this species. Reported near CRI by Diamond and Erlich.
- Blue-tailed Bee-eater *Merops philippinus*
4 Nov, common (60+) in Ramu Valley, mostly in grassland and canefields, including 30 together at the savanna/grassland ecotone.
- Dollarbird *Eurystomus orientalis*
Encountered in small numbers at most sites, but not at the Ramu Valley.
- Blyth's Hornbill *Rhyticeros plicatus*
Up to 6+ individuals found each visit to the Naru Hills forest, where their noisy flight made them hard to miss. 2 or 3 also at Wasab, at the active felling area. Reported at Baiteta by Woinarski.
- Blue-breasted Pitta *Pitta erythrogaster*
Heard infrequently at all 4 forest sites, and seen superbly at South Naru after a careful stalk.
- Singing Bushlark *Mirafrja javanica*
4 Nov, about 20 in the Ramu Valley, where many were skylarking endlessly in the grassland and others were closely seen in ploughed and new growth canefields. Of the localities cited by Beehler *et al.* (1986), the Markham Valley is nearest, and as it is essentially continuous with the upper Ramu Valley it is not surprising that this species is common there.
- Pacific Swallow *Hirundo tahitica*
Common in all open areas, especially near water, except in the Wasab clearcut.

- Tree Martin *Hirundo nigricans*
4 Nov, 2 to 4 seen over the Ramu Valley grassland.
- Richard's Pipit *Anthus novaeseelandiae*
Beehler *et al.* (1986) state "... unconfirmed reports from Markham Valley lowlands and ...". 4 Nov, 8 in the Ramu Valley grassland and ploughed and new growth cane fields. They were not singing much, but I had fine views of several on the ground. Clearly, they are not only present but common in the Ramu/Markham Valley lowlands.
- White-bellied Cuckoo-Shrike *Coracina papuensis*
Widespread, but not common. Found near CRI, Baitabag, Aguru, Naru Hills, and probably Wasab.
- Stout-billed Cuckoo-Shrike *Coracina caeruleogrisea*
4 Nov, 6 to 10 along the Ramu River and in the denser savanna. This was a surprise, as Beehler *et al.* (1986) consider this a forest species that is "occasionally at edge or in regrowth". However, the massive bill, long tail, large size, and males' mask were all seen on several birds. All were shy. Perhaps their elusiveness in these more open habitats, together with the lack of coverage in the upper Ramu Valley (see Singing Bushlark and Richard's Pipit), and perhaps only seasonal presence, have caused this species to be missed. Woinarski reported it at Baiteta.
- Boyer's Cuckoo-Shrike *Coracina boyeri*
Common at the Malpain fruiting tree, and less common at Naru Hills and Wasab.
- Cicadabird *Coracina tenuirostris*
1 to 3 at Baitabag Mission, Malpain, and Tab Island. All birds were in female plumage. My latest date was 2 Oct, so probably most migrants are gone by the middle of this month.
- Black Cuckoo-Shrike *Coracina melaena*
Infrequently seen at Naru Hills and Wasab.
- White-winged Triller *Lalage sueurii*
4 Nov, 4 in the Ramu Valley; a pair in savanna plus separate male and female in grasslands.
- Black-browed Triller *Lalage atrovirens*
Commonly heard and seen travelling high along most forest edges, less often across the canopy.
- Pied Chat *Saxicola caprata*
4 Nov, common, 20+ in the Ramu Valley grassland and cane fields.
- Blue Jewel-Babbler *Ptilorrhoa caerulescens*
Infrequently heard and glimpsed in forest at Malpain and South Naru.

- Rufous Babbler *Pomastomus isidorei*
Small bands commonly encountered at South Naru, where 1 nest was discovered; less commonly at Naru Hills and Wasab. Often formed the nucleus of a mixed flock.
- Clamorous Reed-Warbler *Acrocephalus stentoreus*
4 Nov, 2 heard singing (1 seen) in Ramu Valley reeds.
- Tawny Grassbird *Megalurus timoriensis*
4 Nov, 1 in reeds by Ramu Sugar cane fields.
- Golden-headed Cisticola *Cisticola exilis*
4 Nov, abundant, 75-100, in the Ramu Valley grassland and savanna. Many were skylarking. Also resident in tall grasses by Baitabag School.
- Rusty Mouse-Warbler *Crateroscelis murina*
Rarely heard in the Naru Hills forest.
- Pale-billed Scrub-Wren *Sericornis spilodera*
21 Nov, 1 low in a mixed flock in Naru Hills forest.
- Yellow-bellied Gerygone *Gerygone chrysogaster*
Uncommonly encountered at Naru Hills, Malpain, and Wasab.
- Green-backed Gerygone *Gerygone chloronotus*
Heard abundantly at Wasab, less common at the other forest sites.
- Fairy Gerygone *Gerygone palpebrosa*
23 Nov, 1 male in a mixed flock in the Naru Hills forest.
- Large-billed Gerygone *Gerygone magnirostris*
24 Oct, a pair along roadside forest edge near South Naru.
- Sooty Thicket-Fantail *Rhipidura threnothorax*
Heard regularly and infrequently seen within all 4 forests, normally only 1 or 2 per visit.
- White-bellied Thicket-Fantail *Rhipidura leucothorax*
Commonly heard and uncommonly seen at virtually all sites, but especially common on the coastal plain near CRI and at South Naru. Seemed more numerous than the last species, as well as more widespread, being tolerant of edge.
- Rufous-backed Fantail *Rhipidura rufidorsa*
5 Oct, 1 in forest at Malpain.
- Chestnut-bellied Fantail *Rhipidura hyperthra*
Twice a pair in Naru Hills forest, once part of a mixed flock.
- Northern Fantail *Rhipidura rufiventris*
Small numbers in all forest sites.

- Willie Wagtail *Rhipidura leucophrys*
Abundant and ubiquitous in all areas except forest.
- Island Monarch *Monarcha cinerascens*
2 Oct, 1 seen within the strand forest on Tab Island. Inconspicuous, and not found on subsequent searches.
- Spot-winged Monarch *Monarcha guttula*
Regularly found in all forests, and common at South Naru.
- Hooded Monarch *Monarcha manadensis*
Uncommon but regular in forest at Malpain, South Naru, and Naru Hills.
- Golden Monarch *Monarcha chrysomela*
Uncommon at all forest sites, both within the forest and along edges.
- Friiled Monarch *Arses telescopthalmus*
Regular in all forests, but appeared more common at Malpain and Naru Hills. 5 Oct, pair building a nest at Malpain; I was unable to relocate the spot on later visits.
- Shining Flycatcher *Myiagra alecto*
Widespread along roads and edges, less in forest. Appeared more numerous on the coastal plain as near CRI and at South Naru. Also found on Tab Island.
- Yellow-breasted Boatbill *Machaerirhynchus flaviventer*
Single females seen in forest at Naru Hills (thrice) and Malpain, always in mixed flocks.
- Olive Flycatcher *Microeca flavovirescens*
Up to 2 in mixed flocks at Naru Hills forest. Reported at Baiteta by Woinarski.
- Mangrove Golden Whistler *Pachycephala melanura*
Abundant and vocal on Tab Island. Although the PNGBS identified these birds as (Common) Golden Whistlers, on 3 different trips to this island I checked the characters of both males and females and concluded that they were Mangrove Golden Whistlers. Both sexes had grey-edged, not green-edged, secondaries. Males had black tails, and the tails of females were black with grey rectrix edges. The collars and breast bands of males were quite broad. 4 Oct, I recorded ½ hour of songs and calls. Don Robertson (pers. comm.) had independantly identified these as Golden Mangrove Whistlers during a prior visit to Tab Island. Mangrove Golden Whistler is the species to be expected on small coastal islets (Beehler *et al.* 1986).
- Grey Whistler *Pachycephala simplex*
Fairly often heard and seldom seen in all forests.
- Little Shrike-Thrush *Colluricincla megarhyncha*
Regularly found in forest at Naru Hills and Malpain, but did not seem numerous.

- Variable Pitohui *Pitohui kirhocephalus*
Encountered infrequently in forest and edge at Naru Hills, South Naru, and Wasab. Reported near CRI by Diamond and Erlich.
- Hooded Pitohui *Pitohui dichrous*
Encountered in forest at Malpain and Naru Hills. Reported at Wasab by the San Diego Zoo and near CRI by the PNGBS.
- Rusty Pitohui *Pitohui ferrugineus*
Encountered infrequently in forest at South Naru and Naru Hills. Reported at Wasab by the San Diego Zoo. All 3 pitohuis were typically found in small parties as nuclei of mixed flocks.
- Black Berrypecker *Melanocharis nigra*
Small numbers found in all forests and their edges.
- Papuan Flowerpecker *Dicaeum pectorale*
Found at edges of all forests, plus at Baitabag Mission. Seemed most numerous at Baitabag and Naru Hills.
- Black Sunbird *Nectarinia aspasia*
Common at all mainland sites except drier Ramu Valley, where none were seen. Mostly at edges. Uncommon on Tab Island.
- Yellow-bellied Sunbird *Nectarinia jugularis*
Common in disturbed sites and in Ramu Valley savanna and other woods. Not seen by me even at edges of the 4 forest sites, except South Naru, but reported at Baiteta by Woinarski.
- Tawny Straightbill *Timeliopsis griseigula*
27 Oct, 1 hanging upside-down and poking into hanging leaves in the highest canopy at Malpain.
- Long-billed Honeyeater *Melilestes megarhynchus*
26 Sep, pair seen at forest edge at Malpain. Reported at Wasab by the San Diego Zoo.
- Yellow-bellied Longbill *Toxorhamphus novaeguineae*
Found infrequently at all forests.
- Dwarf Honeyeater *Oedistoma iliolophus*
Occasionally seen at Naru Hills, within the forest or at its edge. Reported at Baiteta by Woinarski and at Wasab by the PNGBS.
- Pygmy Honeyeater *Oedistoma pygmaeum*
Seen infrequently at Naru Hills, South Naru, and Wasab. Best observed by following the quick movements of the small bands through the canopy along roadside by using a spotter scope, though this requires fast reactions.

- Green-backed Honeyeater *Glycichaera fallax*
22 Oct, 1 singing briefly in mangroves, then darting into scrub bordering coconut plantation, between JAR gate and Riwo Village.
- Red-throated Myzomela *Myzomela eques*
Seen occasionally in small bands at Naru Hills, on forest canopy edge. Reported at Wasab by the San Diego Zoo.
- Puff-backed Meliphaga *Meliphaga aruensis*
Infrequently seen in forest at Malpain and South Naru.
- Mimic Meliphaga *Meliphaga analoga*
Encountered at virtually all sites. Seemed most common along roads near CRI and in Naru Hills. Not found in dry habitats of Ramu Valley, though it was in a swamp island in their midst. The only meliphaga found away from forest.
- Yellow-gaped Meliphaga *Meliphaga flavirictus*
28 Nov, 1 at South Naru, in the canopy of a lower section of the forest beside the road. I saw all 3 above species of meliphaga at South Naru that morning.
- Varied Honeyeater *Lichenostomus versicolor*
Abundant and conspicuous in coastal habitats, including on Tab Island. Not found by forests or in hills.
- Tawny-breasted Honeyeater *Xanthotis flaviventer*
Commonly heard but seldom seen well; mostly near edges of all forests. Also found at remnant patches and regrowth.
- Plain Honeyeater *Pycnopygius ixoides*
12 Nov, 1 at Wasab; 19 Nov, 1 at South Naru.
- Streak-headed Honeyeater *Pycnopygius stictocephalus*
Seen and heard fairly commonly in second growth edge and tall scrub near CRI and Baitabag, and at Wasab and South Naru. 4 Nov, common in the denser savanna-woodland and swamp forest in the Ramu Valley.
- Meyer's Friarbird* *Philemon meyeri*
Found at all forests, but not conspicuous and typically only small numbers seen. Seemed most common along the road at Naru Hills.
- Helmeted Friarbird *Philemon buceroides*
Common and conspicuous everywhere there are trees, including Tab Island and the drier Ramu Valley.

- Streak-headed Mannikin *Lonchura tristissima*
Common in very small flocks, mostly in tall grass along roads through forest but also visiting larger patches of tall grass in more disturbed areas such as Baitabag. Baptista (ms.) never saw this species in large flocks, but I saw up to 40 in a flock at Malpain, though very few remained there after the tall grass was cut. Not seen in the drier, more open Ramu Valley.
- Grand Mannikin *Lonchura grandis*
4 Nov, small flocks (total 10) only in very tall grasses along streams through the Ramu Valley savanna. 27 Nov, 1 flock of 12 at the Baitabag School. Most of the latter birds were in juvenile plumage.
- Hooded Mannikin *Lonchura spectabilis*
4 Nov, flocks totalling 20+ were only in completely treeless grassland of the Ramu Valley. I did not find this species on the coastal slope, but Baptista (ms.) twice saw 1 individual at Baitabag School.
- Chestnut-breasted Mannikin *Lonchura castaneothorax*
4 Nov, small flocks totalling 20+ only in the grass of savanna in the Ramu Valley. 16 Oct, one pair in the grass along the North Coast Road at the west end of the Madang airport was the only time I found this species on the coastal slope. In contrast, Baptista (ms.) considered it the second most common mannikin around Madang.
- Metallic Starling *Aplonis metallica*
Abundant, often in large flocks, in open areas and edges associated with all forests. Large colony within 2 km of CRI, but rare on the coast itself. Not found in the Ramu Valley. Thus, these two species of starlings have almost completely complementary habitat distributions in this region.
- Golden Myna *Minos anais*
Encountered infrequently at the Naru Hills and near Utu, always in groups of two or three near Yellow-faced Mynas but seeming much more shy. Reported at Wasab by the PNGBS. The Naru Hills site was 600 m elevation, above the maximum 350 m given by Beehler *et al.* (1986).
- Yellow-faced Myna *Mino dumontii*
Fairly common and very conspicuous at edges of all forests. Single or multiple pairs calling from high perches.
- Brown Oriole *Oriolus szalayii*
Fairly common and vocally conspicuous mostly high on the edges of all forests and many areas of secondary growth, including near CRI. Seemed most numerous at Wasab, Baku, and South Naru.

- Sprangle Drongo *Dicrurus hottentottus*
Fairly common and vocally conspicuous within and at edges of all forests. Seemed most numerous at Wasab and Naru Hills. Also found at Baitabag. Often with mixed flocks.
- White-breasted Wood-Swallow *Artamus leucorhynchus*
4 Nov, very common, 50-100, in Ramu Valley.
- Hooded Butcherbird *Cracticus cassicus*
Fairly common and vocally conspicuous at Baitabag Mission. Uncommon at Wasab, Naru Hills, near Utu, and near Aguru. Reported at Baiteta by Woinarski and the PNGBS.
- Lowland Peltops *Peltops blainvillii*
Fairly common at edges of all forests. More numerous at Wasab and Malpain. Uncommon at remnant edges near CRI and elsewhere. Vocally conspicuous.
- White-eared Catbird *Ailuroedus buccoides*
Heard and seen infrequently within forests of Malpain, Naru Hills, and South Naru. Usually located by its harsh hisses.
- Yellow-breasted Bowerbird *Chlamydera lauterbachii*
4 Nov, common in the savanna and at other trees in the drier Ramu Valley. See following species.
- Fawn-breasted Bowerbird *Chlamydera cerviniventris*
4 Nov, common in the savanna and at the other trees in the drier Ramu Valley. These two congeneric bowerbirds were syntopic in the savanna, at least southeast of Hupai, and both were seen repeatedly (10+ of each) wherever there were trees in these drier open habitats.
- Glossy-mantled Manucode *Manucodia atra*
Uncommonly heard and infrequently seen at a variety of forest edges and remnants, most noticeably at Wasab. Also at South Naru, Malpain, and Nobanob, and reported near CRI by Diamond and Ehrlich. These locations are at lower elevations than the ridgetops of Naru Hills, where the following two species were observed.
- Crinkle-collared Manucode *Manucodia chalybata*
31 Oct, one pair seen and heard along road in Naru Hills.
- Jobi Manucode *Manucodia jobiensis*
9 Oct, one pair seen and heard along road in Naru hills.
- Magnificent Riflebird *Ptiloris magnificus*
30 Sep, male heard and two females seen in forest at Naru Hills. Reported at Wasab by San Diego Zoo.
- King Bird of Paradise *Cicinnurus regius*
Uncommonly seen and heard within all forests.

- Magnificent Bird of Paradise *Cicinnurus magnificus*
Occasionally heard and rarely seen in the forest at Naru Hills and just beyond feeling zone at Wasab. Possibly heard at South Naru. No adult males seen.
- Raggiana Bird of Paradise *Paradisaea raggiana*
30 Sep & 9 Oct, single female-plumaged bird(s) seen at the same place along road at Naru Hills; 21 Oct, female-plumaged bird at Nobanob.
- Lesser Bird of Paradise *Paradisaea minor*
Common and vocally conspicuous at Naru Hills, South Naru, and Wasab. Apparently less common at Malpain. Also found in my only visits to Utu and Nobanob.
- Grey Crow *Corvus tristis*
Common and conspicuous in a few raucous, highly mobile flocks at Naru Hills and Wasab, less commonly at Malpain.
- Torresian Crow *Corvus orru*
Common and very conspicuous in coastal areas, including Tab Island. Less commonly found in the forested and/or hilly sites. Not found in the drier Ramu Valley. Numbers regularly made long, high flights parallel to the coast, especially early and late in the day.

DISCUSSION

Terns of several species use the Gogol River mouth and the Meiro mudflat for roosting. Otherwise the shore in the Madang region seems to be unused by marine birds.

Waders and herons are relatively scarce, and the only sites of concentration found are the Meiro mudflat and the adjacent Madang airport. During October-November, when the numbers of southbound waders should be at or near their yearly maxima, 12 of the 13 species there were represented by fewer than 15 individuals. Pacific Golden-Plover greatly outnumber all other waders combined, with counts ranging up to 230. Waders were seen in both juvenal and basic plumages, so birds of both age classes visited Madang.

Freshwater habitats are very few and small, and local populations of birds inhabiting them are correspondingly low. Ponds even within metres of each other vary greatly in their use by birds, perhaps largely reflecting their safety from predation. The smaller pond at Alexishafen held ten visible species of freshwater and marsh birds.

Although genuine marshes seem rare in the Madang area, damp areas of tall grass or bamboo are common along roads. Bird populations of these and other open habitats must be expanding as the forests are removed.

The drier open habitats of the upper Ramu Valley (savanna grassland and sugarcane fields) host avifaunas quite different from that found in openings along the wet Madang coastal plain. Some of these species are typical of the large highland valleys, e.g. Singing Bushlark,

Richard's Pipit, Hooded Mannikin and Yellow-breasted Bowerbird. Others represent coastal plain savanna species, e.g. Pied Imperial Pigeon, Blue-tailed Bee-Eater, White-winged Triller, and Fawn-breasted Bowerbird. A large component is widespread in open habitats of both highlands and lowlands. Edge species are also conspicuous in the Ramu Valley.

Most species of edge and regrowth seem to be widespread and thriving in the Madang region, as would be expected with the declining of the forests. Except for secretive species, most are easily found and observed close to roads, without obvious localization of these species.

Most forest species probably inhabit all of the four good forests I birded. Undoubtedly there are differences in their species lists, but many more observations would be necessary to define these differences. South Naru, the only flat forest should lack some of species found in the hill sites, and vice versa. The difference most apparent to me was that the lesser human presence in the Naru Hills forest allowed the persistence of more vulnerable birds than at the other sites. These was measured in three ways: (1) presence of very sensitive species such as the Northern Cassowary and Vulturine Parrot; (2) abundance of other large vulnerable birds including Blyth's Hornbill, Palm Cockatoo, Sulphur-crested Cockatoo; (3) species diversity of certain taxa, e.g. seven of the eight species of birds of paradise were found at Naru Hills, versus three or four species at each of the other forests. Nevertheless, based on my limited sampling, the other forests seemed to retain most of their original species, and some large and/or sensitive birds were found there (e.g. New Guinea Harpy-Eagle at Malpain, Blyth's Hornbill at Wasab, and Brown-collared Brush-Turkey at all four sites). The flat coastal plain forests and the birds restricted to them should be the most threatened around Madang. Perhaps one reason I did not see a major difference between the South Naru forest and the three hilly sites is that South Naru may have already lost the species most distinctive of the flat forest.

The avifauna of the coastal barrier islands represent a small subset of the birds on the mainland coast, with most landbirds belonging to ubiquitous species. A few species are virtually restricted to these island, e.g., White-headed Kingfisher, Island Monarch, and Mangrove Golden Whistler. Common Scrubfowl has remained abundant on uninhabited Tab Island, whereas it has become scarce on the mainland.

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