

Greater Streaked Lories *Chalcopsitta scintillata* were not recorded on the first visit but were seen on the subsequent three visits. Between two to eight birds (one to four pairs) were noted. They were present in the tree for 19% of the observation time. On approaching and leaving the tree the birds were noisy but were mostly quiet while feeding. They moved from flower-cluster to flower-cluster by walking along the branches. On the flower-clusters they moved acrobatically from flower to flower, hanging upside down to reach the more inaccessible ones. They did not appear to damage the flowers, i.e., they were not flower predators. No intraspecific aggression was noted and although competing for the same resource no interspecific aggression with the friarbirds was recorded.

Western Black-capped Lories *Lorius lory* were present in the tree for 35 minutes (7% of the observation time). Two to four were recorded feeding in the tree. They were not seen in the tree at the same time as the Greater Streaked Lories. As with the Greater Streaked Lories they were mainly quiet while feeding, but noisy when flying to and from the tree. They were also more acrobatic than the Helmeted Friarbirds when feeding at the lower clusters.

The remaining six species, all honeyeaters, which visited the *Syzygium* tree to feed, did so only briefly. Each feeding visit lasted less than a minute, with the birds only feeding at one or two flower clusters as they passed through the tree. These six species made 13 feeding visits to the tree. Three species made five feeding visits on 5 September and four species, plus an unidentified meliphaga made eight feeding visits on 20 September. On 5 September one Tawny-breasted Honeyeater *Xanthotis flaviventer*, two Puff-backed Meliphagas *Meliphaga aruensis*, and one Dwarf Honeyeater *Oedistoma iliophus* passed through the tree with a mixed-species feeding flock. A single Tawny-breasted Honeyeater had also been recorded earlier in the first observation period. On 20 September an unidentified meliphaga and a Red-throated Myzomela *Myzomela eques* were with a party that also included two Helmeted Friarbirds and also fed on the *Syzygium* flowers. One male Papuan Black Myzomela *Myzomela nigrita*, two Mimic Meliphagas *Meliphaga analoga* and two Tawny-breasted Honeyeaters moved through the tree with another mixed-species feeding flock later in the day. No interspecific aggression was noted among the species that made up these flocks. However, despite this, I think the Helmeted Friarbirds had been defending this tree against smaller honeyeaters as none were recorded on 12 and 13 September. Only when the numbers of flowers were much reduced, on 20 September, and the friarbirds were only noted briefly, were the smaller birds recorded more frequently.

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OBSERVATIONS OF BIRDS FEEDING IN A FRUITING FIG *FICUS* SP. IN VARIRATA NATIONAL PARK

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On 10 and 11 August 1990 I observed and noted birds that fed on the fruits of a large strangler fig *Ficus* sp. (Moraceae). The tree was an emergent from the forest with a wide canopy, between the Circuit and Boundary trails in Varirata National Park, Central Province. My observations were between 06:30 and 08:30 on both days. I recorded 12 species feeding on the fruit. Most activity was recorded between 06:30 and 07:45. Most species visited the tree for between 2-3 minutes, although some fruit-doves stayed for as long as an hour.

The most frequent visitors to the tree were female-plumaged Raggiana Birds of Paradise *Paradisaea raggiana*. I recorded 18 feeding visits in the four hours and only one bird had male plumage (with no plumes). Only once were there two female-plumaged birds in the tree simultaneously. Several different visits were so close together that I think they were different birds. Their visits ranged from 1-6 minutes duration, with an average of c.2 minutes. It is possible that there were two nesting females using the tree as a food source for their young, while the single male was there opportunistically.

Four species of fruit-doves were recorded feeding: Pink-spotted *Ptilinopus perlatus*, Beautiful *P. pulchellus*, Superb *P. superbis* and Orange-bellied *P. iozonus*. Of these, Pink-spotted Fruit-Doves were almost constantly in the tree, with up to three simultaneously. Beautiful Fruit-Doves came in pairs, spending 10-20 minutes feeding. Only one Superb Fruit-Dove, a male, was recorded. A pair of Orange-bellied Fruit-Doves made only one visit, feeding for about 15 minutes. One other pigeon, a Purple-tailed Imperial Pigeon *Ducula rufigaster* stayed in the tree for c.30 minutes.

Two species of cuckoo-shrike were recorded. Boyer's Cuckoo-Shrikes *Coracina boyeri* were recorded seven times, only once staying longer than 2 minutes. They usually came in pairs and fed by snatching fruit on the wing, then perching to swallow. A Stout-billed Cuckoo-Shrike *C. caeruleogrisea* visited once for a period of one minute. It did not feed.

Of the remaining four species, the Helmeted Friarbird *Philemon buceroides* was recorded five times: twice a pair and three times a single bird. They averaged about 5 minutes for each visit. Magnificent Riflebirds *Ptiloris magnificentus* were recorded three times. Once a lone male, once a lone female and once a male and two females which arrived and left together. The lone female fed for seven minutes and the lone male for one minute. The group of three birds spent four minutes in the tree, but only the females were observed feeding. The male of the group was very vocal. Single Hooded Pitohuis *Pitohui dicrous* were recorded three times and never spent more than two minutes feeding in the tree. Male Black Berrypeckers *Melanocharis nigra* were constantly in the tree and fed several times.

This species of strangler fig would appear to be an important food source for several species of birds, though the fruit do not have a high nutritional value (B.M. Beehler pers. comm.).

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*.

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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

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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