

# THE SUNBIRD

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## THE BIRDS OF CAPE YORK PENINSULA

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### PART 2 DISTRIBUTIONAL PATTERNS

On Cape York Peninsula, north of 16°S, 108 species of water birds and 258 species of land birds have been recorded; at least 23 of the land birds are represented by more than one race. The species and subspecies distribution within the Peninsula is tabulated in the Appendix and summarized in Table 1. The Peninsula is divided into six mainland regions (see Part 1) and two island regions, the Great Barrier Reef region (GBR) and the Torres Strait region (TS). Forty-seven species of water birds and 75 species of land birds occur in all mainland regions, while 13 species of water birds and 42 species of land birds are restricted to one region.

The species distribution is influenced by (1) colonization across Torres Strait in recent geological times, (2) the mosaic of habitat distribution which isolates wet-adapted species in many parts and (3) the influx of winter migrants from the south and summer migrants from the north. These three aspects are discussed below in relation to geographical distribution, habitat distribution and migration.

#### GEOGRAPHICAL DISTRIBUTION

##### Water birds

More species of sea birds, including the wedge-tailed shearwater, boobies, cormorants, frigate-birds, tropic-birds and terns occur on the east coast and adjacent islands than in TS or on the west coast. In contrast, more species of waders occur on the west coast, particularly South West (SW), than on the east coast. Most herons, egrets and bitterns occur all round the Peninsula, but the pied heron and the little bittern have not been recorded from the South East (SE) and the North (N) respectively. A large breeding colony of nankeen night herons appears to replace the reef heron on Raine Island (GBR) and the only offshore nesting stations of the Australian pelican in eastern Australia occur around the Peninsula.

In spite of the extensive aquatic habitats which develop during the wet season, freshwater birds are not so numerous on the Peninsula as in the southern Gulf. Species recorded in large numbers are the Australian pelican, straw-necked ibis, magpie goose, Burdekin duck, black duck, grey teal and brolga. Other water birds are uncommon, or absent from many parts. There is 50 - 80% species overlap between different regions. The Great Barrier Reef region, however, shares rather less of its bird fauna with the mainland regions (40 - 52%), and 56% with TS including the Wilson storm-petrel which is unique to the combined

TABLE 1

The number of species of land and water birds known from eight regions of Cape York Peninsula (see Appendix).

Region	Water birds	Land birds	Total
GBR	60 (6)*	58 (0)*	118
ESE	63 (0)	169 (27)	232
SE	79 (3)	174 (1)	253
E	74 (0)	188 (5)	262
N	78 (0)	172 (1)	250
TS	63 (0)	82 (0)	145
W	73 (2)	162 (0)	235
SW	76 (2)	151 (8)	227
Total	108 (13)	258 (42)	366

\* The number of *species* unique to each region is given in brackets. There are eight unique *subspecies* of land birds; seven in ESE and one in TS.

region. The low similarity of GBR with other regions is largely due to unique occurrences of some sea birds and absence of many freshwater birds in this region. Apart from the above patterns, the presence and absence of water birds contributes little to the general geographic pattern of distribution over the Peninsula.

#### Land birds

One hundred and sixty-three species of land birds from Cape York Peninsula occur in New Guinea and the remaining 95 are endemic to Australia. Their distribution within Australia is further analysed in Table 2.

The close affinity of Cape York Peninsula with the Papuan region is shown by the large proportion of Peninsula species overlapping with the Papuan region. A numerical analysis of Australian land birds separated the Peninsula north of Cooktown as a significant

subprovince at the superspecies level (Kikkawa and Pearse 1969), and an analysis of faunal elements at the generic level for the whole of the Indo-Australian region separated Cape York Peninsula from the rest of Australia and grouped it with the Papuan region on the basis of the Sunda-based element (Holloway and Jardine 1968).

The species shared with Papua, which are restricted to the Peninsula or distributed to north eastern or eastern Australia,

TABLE 2

The distribution within Australia of land birds known from Cape York Peninsula

Distribution, restricted to:	Species shared by the Papuan region		Species endemic to Australia		
	Total species	Closed forest species	Total species	Closed forest species	
				North of Cooktown	South of Cooktown
C.Y. Peninsula	21	18	1	0	0
C.Y.P. and NW Aust.	5	0	7	0	0
C.Y.P. and NE Aust.	13	11	19	2	14
Northern Aust. (NA)	15	7	9	0	0
Eastern Aust. (E)	20	15	28	4	19
NA + E	44	12	6	0	0
Australia general	45	0	25	0	0
<b>Total</b>	<b>163</b>	<b>63</b>	<b>95</b>	<b>6</b>	<b>33</b>

are mostly closed forest (rain forest) birds (75 - 86%) whereas those having north western or pan-continental distribution are birds of other habitats. Since it is likely that Australia produced more semi-arid adapted forms and New Guinea more wet-adapted forms (Brereton and Kikkawa 1963), most closed forest birds of north eastern Australia are considered to be colonizers from New Guinea and semi-arid adapted species in New Guinea are colonizers from northern Australia (Keast 1961).

Among the Australian endemics the white-streaked honeyeater is the only species endemic to Cape York Peninsula. It does not occur in closed forest. There are only six species (6%) of the Australian endemic group that occur in closed forest habitats of the Peninsula north of Cooktown (the Peninsula proper). Another 27 species of endemic closed forest birds are restricted to the region south of Cooktown (ESE). Many of them are endemic to the tableland

region of north Queensland where closed forest has the greatest species diversity in Australia. This bird fauna resembles that of montane New Guinea, but the basic elements giving rise to the present faunas of the two regions are much older than the closed forest elements of the Peninsula proper, suggesting independent evolution in recent geological times. Thus Schodde and Calaby (1972) consider that the present day closed forest bird fauna of eastern Australia south of Cape York Peninsula originated in Australia and the Peninsula has not played a significant role in bridging this fauna with the Papuan fauna.

In eastern Australia the greatest number of species occurs in the north Queensland (Cooktown to Townsville) tract of closed forest where the lowland and the highland bird faunas are clearly distinguishable. The *typical highland fauna* is related to that of *subtropical* Australia where the altitudinal difference is obscured by clearing of most of the lowland closed forest (Kikkawa 1970). In subtropical Australia the wet sclerophyll forest and closed forest share many species (Kikkawa 1968), and the closed forest fauna is more distinct in the *highland* where attenuation is less marked and additional endemic species appear. The closed forest bird fauna of the Peninsula proper however is a *typical lowland fauna* of North Queensland with some complementary Papuan forms replacing north Queensland forms. The highland fauna is not differentiated in the Peninsula proper. The only highland element of north Queensland occurring in Cape York Peninsula is the Lewin honeyeater, which inhabits the mountains of the McIlwraith Range above 500 m. This and the grey swiftlet are the only two endemic Australian species of closed forest habitats showing disjunct distribution to the highland closed forest of the Peninsula proper.

The sclerophyll habitats adjacent to north Queensland closed forest are occupied by bird fauna comparable to that of the subtropical region, though partly attenuated and partly complemented. In Cape York Peninsula it is further modified by more attenuation but also by addition of species typical of northern monsoon habitats.

The degree of species and subspecies overlap between regions is shown in Table 3. The small numbers of land birds in GBR and TS (Table 1) are responsible for low overlap percentages between these and other regions.

Large species overlaps are seen in the regions SE-E-N-W, where the species characteristic of the Peninsula proper are largely confined. Discontinuity of the faunal composition is thus seen between ESE-SE and SW-W. Along the east coast the greatest barrier against the dispersal of wet-adapted forms is created by a dry zone between Cooktown and the Stewart River (SE). Nineteen of the 20 species characteristic of the highland closed forest are restricted to mountains south of Cooktown (ESE) and they have no counterparts (complementary species) in the Peninsula proper. However, the lowland species show different degrees of isolation and differentiation across this barrier. There are some small patches of low-

land closed forest habitats along the rivers and on rare basaltic hills which support an impoverished wet-adapted fauna. It includes common lowland species, such as the grey whistler (brown whistler), rufous shrike-thrush and lesser lewin honeyeater, which show no apparent racial differences across the barrier. However, a high degree of subspecies overlap in the regions E-N-W and separation from ESE produced racial differences across SE for a number of species. At present the racial status of these species in small patches of closed forest habitats of SE is not fully understood. The species concerned are the brush turkey, wompoo pigeon, fig-

TABLE 3

The percentage overlap of species and subspecies of land birds between regions

	GBR	Species overlap						
		ESE	SE	E	N	TS	W	SW
GBR		25	26	29	31	41	26	23
ESE	4		63	60	59	36	52	49
SE	4	40		74	72	38	76	68
E	14	5	21		82	39	72	56
N	14	5	21	75		42	74	58
TS	14	6	14	38	38		37	28
W	9	5	21	58	58	33		67
SW	7	3	19	43	43	14	52	

parrot, barking owl, boobook owl, laughing kookaburra, noisy pitta, varied triller, grey fantail, boat-billed flycatcher, spectacled flycatcher, graceful honeyeater and black butcher-bird. Other species with a distributional gap, such as the spotted catbird (catbird) and green-winged pigeon, which have not been given different racial status across this barrier are likely to be as much differentiated as those listed above.

Those birds that have complementary species across the dry zone barrier in SE are the little scrub-wren/large-billed scrub-wren (some differences in their ecology and possible overlap of range south of Cooktown), white-faced robin/pale yellow robin (gap apparently wide), frill-necked flycatcher/Australian pied flycatcher (gap apparently wide), tawny breasted honeyeater/Macleay honeyeater (gap north of Cooktown) and magnificent rifle-bird/paradise rifle-bird (gap apparently wide). These complementary races and species in the Peninsula proper also occur in the Papuan region. In addition there are other species of Papuan origin, which are restricted to the closed forest of E and N and which have no complementary species further south. Of these the red-sided parrot, red-cheeked parrot and green-backed honeyeater are restricted to the closed forest of Iron Range and the McIlwraith Range (E), the

little yellow flycatcher to that of E and the Heathlands, and the blue-breasted pitta, fawn-breasted bower-bird and manucode to that of E, Heathlands and Lockerbie Scrub (N). Some of the species shared by the Papuan region are restricted to the extensive closed forest of E and not found in N. Other species which are common in the East but do not appear to reach the closed forest of N are the spotted catbird and the grey-breasted silvereye. Those that are common in the East but rare in the North are the brown pigeon, white-faced robin, northern scrub-robin and red-browed finch.

There are two alternative hypotheses to explain the distribution of the closed forest bird fauna of Cape York Peninsula. One is that the present fauna is an assemblage of recent colonizers from the Papuan region and the other is that it is a remnant of the attenuated Papuan fauna once contiguous with that of lowland Papua.

The complementarity of the wet lowland faunas of the Peninsula and north Queensland suggests speciation in isolation rather than successive colonization. The few species restricted to the northern Peninsula are likely to be recent colonizers from the Papuan region. Although all closed forest birds of the Peninsula proper are shared by the Papuan region, many wet-adapted lowland species of the Papuan region are absent from the Peninsula. This fact favours the colonization hypothesis.

However, the colonization is not likely to have been facilitated by the land bridge between New Guinea and northern Australia, at least during the peak of the last glaciation (about 20,000 B.P.) when the climate was probably drier than it is today (Webster and Stretten 1972). It is even less likely that the closed forest faunas of the two regions were contiguous during the late Pleistocene. The colonization of closed forest habitats of the Peninsula proper is much more recent. Nix and Kalma (1972) postulate such a possibility for the period following a rapid rise in sea level before Torres Strait was last flooded at about 8,000 B.P. The climate is thought to have been slightly warmer and precipitation much higher than at present, with possible expansion of closed forest forming a nearly continuous strip to Cape York.

Accepting this possibility, the closed forest of Iron Range-McIlwraith Range may be considered as the most recent refuge for wet-adapted forms; today this region (E) maintains the greatest diversity of land birds within the Peninsula (Table 1).

Previous arid periods were probably very severe and the closed forest of north Queensland acted as the northernmost refuge for wet-adapted forms. Thus the endemic species of the highland fauna are a relict of the wet- and cool-adapted fauna of the old Papuo-Australian stock. Wet lowland species are colonizers in recent times, showing various degrees of isolation from the northern forms.

Faunal discontinuity in the west is different to that in the east. The habitat of species characteristic of the southern Gulf gradually

disappears as one proceeds eastwards and northwards. The South West region is already a fringe of the relatively dry Gulf habitat and consists of grassland and low open woodland. The little quail, flock pigeon, budgerigah, masked wood-swallow and singing honey-eater are examples of such species recorded only in SW. The grey fantail and rufous fantail have a subspecies each in the Gulf region, ranging north to the West. Some species extend their range from SW to the sclerophyll habitats of SE (apostle bird, singing bushlark) while some finches (Gouldian, black-throated, masked, star), the weebill, rufous-throated honeyeater and little wood-swallow occur in W as well. An unusual disjunct distribution is shown by the white-gaped honeyeater which occurs in both SW and ESE.

Among the northern Australian and pan-continental birds, there are at least 35 species of sclerophyll habitat from the Peninsula which are represented by different subspecies in north western Australia. These species are distributed widely over the Peninsula without differentiation and contribute little to the discontinuities. Examples of well defined subspecies having irregular distribution include the New Guinea scrub fowl, known from a few islands in north eastern Torres Strait, and the Peninsula pied currawong which occurs in the drier central hills from Wenlock to Musgrave in the south and also east to the sandstone hills north of Cooktown.

#### HABITAT DISTRIBUTION

Major vegetation types used for the description of habitats have been derived chiefly from the work of Pedley and Isbell (1971) (see PART 1).

##### Island habitats

Hindwood *et al.* (1963) classified the cays and islets of the south west Coral Sea into three types according to their vegetation. The cays are common in GBR, rare in TS and absent from W. On unvegetated cays sea birds establish nesting colonies on sand or shingle. Usually two or three species from among the black-naped tern, crested tern, lesser crested tern, roseate tern and boobies co-habit on these cays. Cays covered with low vegetation support up to seven from the following: boobies, wedge-tailed shearwater, lesser frigate-bird, red-tailed tropic-bird, Caspian tern (Raine Is.), crested tern, roseate tern, noddy, sooty tern and bridled tern. The greater frigate-bird (Coral Sea) and white-capped noddy are found on wooded cays in addition to those breeding on cays with low vegetation. Among breeding land birds the pale silvereye is unique to wooded cays.

Many continental islands have coastal vegetation, including mangroves, which provides nesting habitat for the Torres Strait pigeon. Some islands (*e.g.* Moa Is. in TS) support closed forest and its associated fauna.

### Coastal habitats

1. Mudflats and mangroves. Mudflats are best developed on the west coast and large numbers of migratory waders appear there. Herons, kingfishers and the Burdekin duck appear on the edges of mangroves. The mangrove habitat is most extensive around the mouth of the Escape River in N, though it is also commonly found along estuarine and tidal inlets of the west coast, particularly the north west, where they do not form an outer shoreline. A typical association of mangrove birds is the mangrove kingfisher, varied triller, mangrove robin, black-throated warbler, yellow-breasted sunbird, graceful honeyeater, dusky honeyeater, red-headed honeyeater, varied honeyeater, yellow oriole and black butcher-bird. Mixed flocks of insectivorous and nectar feeding birds, which are often encountered in the southern Gulf, appear to be absent along the Peninsula. The white-breasted whistler *Pachycephala lanioides lanioides* and the buff-sided robin *Poecilodryas superciliosa cerviniventris* are absent, while the yellow silvereye and rufous-banded honeyeater, which are common in the southern or western Gulf, occur only sporadically in N and W. The robust whistler (mangrove golden whistler) is restricted to parts of N and E, leaving a large distributional gap from its western subspecies.

2. Shoreline habitats. Some sandstone or rocky shores are found along Torres Strait and parts of isolated headlands. The oystercatchers, wandering tattler, turnstone, sea eagles and osprey are among the few that occasionally appear in this habitat. Most of the Peninsula shoreline is sandy beaches which are only sparsely used by oystercatchers, the red-capped dotterel, Australian pratincole, jabiru and some migratory waders.

Stranded vegetation on the foredunes of the east and west coasts supports different species of plants (Pedley and Isbell 1971), but similar species of birds. The most typical species is the bar-shouldered dove, but the peaceful dove, diamond dove (SW), rain-bow bee-eater, dollar-bird, spangled drongo, black-throated warbler, mistletoe bird, brown honeyeater (SW), lesser lewin honeyeater (SE) and great bower-bird (SW) are often associated.

3. Saltpans. This bare habitat is common behind foredunes or mangroves on the west coast and it is extensive along Princess Charlotte Bay. The following species are listed by Thomson (1935) as characteristic of this habitat: masked plover, white-faced heron, white-necked heron, black-fronted dotterel, jabiru, brolga, magpie lark, Australian pipit and golden-headed fantail-warbler.

### Heath

Heath is most extensive in N where it is almost continuous from Shelburne Bay to the mouth of the Jardine River. It is also fairly extensive between Cape Bedford and Cape Flattery, but otherwise it is isolated in patches along the east coast. The heath of the Peninsula, called "northern Wallum" by Brass (1953), is isolated from similar "wallum" vegetation of southern Queensland



and contains unique associations of bird species.

The white-streaked honeyeater is the dominant species associated with flowering trees in the heath and is restricted to this habitat. The other honeyeaters are more widely distributed both geographically and ecologically, and include the banded, brown-backed, brown, dusky, graceful (N), lesser lewin (SE), tawny-breasted and white-throated honeyeaters and the helmeted friar-bird. Their presence depends on the flowering of nectar producing plants and proximity of other vegetation types, particularly closed forest.

Apart from honeyeaters, the bar-shouldered dove, spotted nightjar, rainbow bee-eater, lovely wren, red-backed wren, spangled drongo, mistletoe bird, yellow-breasted sunbird and white-breasted woodswallow are often encountered. In open heath, where vegetation cover is low and sparse, the emu, Australian bustard, spotted harrier (SE) and black-shouldered kite have been recorded.

The dune vegetation associated with heath produces a horizontal and vertical mosaic pattern of habitats and thus produces an unusual association of birds. Scrub vegetation, for example, contains some closed forest birds (*e.g.* rufous shrike-thrush, fawn-breasted bower-bird) as well as birds of the heath. Swale lakes are dystrophic and do not support much animal life. The few species that occur there are never abundant (*e.g.* banded land-rail, pied heron, whiskered tern, white-breasted sea eagle, swamp harrier and black duck). *Melaleuca* swamps in swales are not extensive, but nearly always contain the shining flycatcher and sometimes the little kingfisher. Stabilised old dunes carry sclerophyll woodland and patches of closed forest in close proximity to heath vegetation. The Torres Strait pigeon, white-tailed nightjar and other closed forest birds appear commonly in such habitats.

#### Grassland and low open woodland

This habitat is most extensive in SW where grassland occupies the coastal fringe behind salt pans, and low open woodland of *Melaleuca* and *Eucalyptus* extends inland on flat plains. Here the dense summer growth is burnt in each dry season. Birds of prey and finches maintain a high diversity and density. Among some 60 species also commonly found are the emu, Australian bustard, red-backed quail (eastern), common bronzewing, crested pigeon, varied lorikeet, galah, little corella, red-winged parrot, blue-winged kookaburra, red-backed kingfisher, pheasant coucal, Australian pipit, singing bushlark, grey-crowned babbler, Jacky winter, restless flycatcher, red-backed wren, red-browed pardalote, banded honeyeater, bar-breasted honeyeater, rufous-banded honeyeater, rufous-throated honeyeater, blue-faced honeyeater, little friar-bird, pied butcher-bird and great bower-bird. Mosaic habitat here is created by seasonal inundation of the plains and by closed forest patches developed along the rivers. The gallery forest supports the brush turkey, red-crowned pigeon, Torres Strait pigeon, red-tailed black cockatoo, barking owl, forest kingfisher, cicada bird, varied triller, large-billed warbler, white-browed

robin, yellow honeyeater, white-gaped honeyeater, yellow oriole, yellow figbird and spangled drongo.

Low open woodland dominated by *Melaleuca viridiflora* also occurs in patches throughout the Peninsula. Depending on the region different combinations of lorikeets and honeyeaters congregate in this habitat during the flowering season of *Melaleuca*.

#### Woodland and open forest

This is the most extensive habitat, and all dry-adapted birds are recorded in this habitat in one or more regions. Apart from the common land birds occurring in grassland and low open woodland, the following are noteworthy: squatter pigeon, pale-headed rosella, oriental cuckoo, koel, channel-billed cuckoo, northern fantail, lemon-breasted flycatcher, leaden flycatcher, grey shrike-thrush, black-faced cuckoo-shrike, striated sittella, black tree-creeper, black-headed pardalote, scarlet honeyeater (E), singing honeyeater (SW), noisy miner (SE), olive-backed oriole and black-backed butcher-bird. Not all species occur in every habitat of this type. For example, both the brown-backed and the bar-breasted honeyeaters are associated with *Melaleuca* habitat but the former is found on the eastern side and the latter on the western side of the Peninsula. The golden-winged parrot occurs only in southern parts of the Peninsula in association with extensive flats studded with large termite mounds.

Mosaic distribution is produced by isolated patches of closed forest and gallery forest along creeks, which support an impoverished closed forest fauna in the midst of sclerophyll habitats.

#### Closed forest

Closed forest includes mangroves and vine forest (rain forest). The types of vine forest (Webb 1968), known from the Peninsula (Webb in Pedley and Isbell 1971) are: complex mesophyll vine forest (wet lowland in ESE), simple/mixed notophyll vine forest with emergent *Agathis* (cloudy wet highlands and moist tablelands in ESE) and with emergent *Araucaria* (near the top of McIlwraith Range in E), semi-deciduous mesophyll vine forest (on alluvia in E), semi-deciduous notophyll vine forest with or without sclerophyll emergents (in patches in SE, E and N), microphyll evergreen vine thicket (Mt Tozer in E), evergreen notophyll vine forest/thicket with sclerophyll emergents (in coastal heath in SE, E, N), deciduous vine thicket/forest (western slopes of McIlwraith Range in E), semi-deciduous vine thicket (gallery forest fringing streams, patchily distributed throughout).

The highland endemic elements of north Queensland extending their range to south of Cooktown (ESE) are associated with notophyll vine forest. They are the northern chowchilla, mountain thornbill, fern-wren, grey-headed robin, bower shrike-thrush, bridled honeyeater, tooth-billed bower-bird and golden bower-bird. More widely distributed species associated with this vegetation in ESE are the

white-headed pigeon, king parrot, Australian ground-thrush, eastern whipbird, brown warbler, yellow-throated scrub-wren, golden whistler, little tree-creeper, Lewin honeyeater, eastern spinebill and satin bower-bird. Except for the Lewin honeyeater, which occurs in the similar habitat of the McIlwraith Range, these species are absent from the Peninsula proper.

Thirty four species are associated with mesophyll vine forest and other lowland closed forests throughout the eastern regions from ESE to N, whereas five species of this habitat in ESE are replaced by the complementary New Guinea species in the comparable habitat of the Peninsula proper. In addition there are seven species unique to the Peninsula proper within Australia.

Ecological relations of closed forest birds to different types of vine forest are not fully understood. However, there are indications that like sclerophyll habitats different closed forest habitats have different associations of birds. For example, the white-tailed kingfisher is found only on coastal lowland vine forests, including evergreen notophyll vine forest on dune in the North, whereas the blue-breasted pitta is restricted to semi-deciduous mesophyll vine forest. In ESE the white-tailed kingfisher has been recorded from about 370 m on the western scarp of Big Tableland (Storr 1953). The white-browed robin occurs in closed forest patches of SE, but appears more commonly in gallery forest elsewhere. The shining starling is restricted to well developed vine forest and adjacent vegetation of the east coast, where it is common in summer, and does not appear in gallery forest inland. Many species reach patches of closed forest on the west coast following gallery forest. Such species recorded from Weipa (Kikkawa 1975) include palm cockatoo, white-tailed nightjar, yellow-billed kingfisher, lovely wren, little scrub-wren, frill-necked flycatcher, grey whistler, rufous shrike-thrush, graceful honeyeater, tawny-breasted honeyeater and magnificent riflebird.

#### MIGRATION

Migration between the Peninsula and other regions of Australia or New Guinea is poorly understood and the movements of birds within the Peninsula are even less known. The complex distributional pattern of birds on the peninsula is partly due to the seasonal movements. Many species, particularly water birds, move according to the local availability of water. The Peninsula also provides wintering grounds for southern migrants. A tentative summary of known and suspected movements is outlined here. Wet season migrants are grouped with summer visitors and the dry season migrants with winter visitors. Movements of sea birds from their breeding grounds are virtually unknown and are not discussed.

#### Summer visitors

Among non-breeding summer visitors from the northern hemisphere,

waders are the most conspicuous group, arriving about September and leaving in April. The numbers vary through the summer months, but most species remain on both the east and the west coasts. It is unlikely that other water birds of the northern hemisphere make regular visits, though the Asiatic common tern on the east coast and the Garganey teal in the west may be rare visitors. Of the northern land migrants, the oriental cuckoo, spine-tailed swift and fork-tailed swift are regular visitors in mid-summer.

There are five breeding summer visitors. Torres Strait pigeons arrive in September and leave in March, nesting on the west coast and on islands off the east coast. They feed on fruits in closed forest and adjacent sclerophyll habitats on the mainland, making daily flights from the roosting or nesting grounds. The shining starling, another fruit-eating species, arrives in July or August and starts nesting soon after. Three were seen on 18 July 1976 at the McIvor River. If no birds overwinter on the Peninsula this is the earliest record of their arrival. Of the three ground feeding summer visitors, the white-tailed kingfisher and the blue-breasted pitta arrive in late November or December, and depart in March or April. The white-tailed kingfisher arrives in the Peninsula about a month or two later than it arrives in the closed forest of north Queensland, south of the Peninsula. The blue-breasted pitta is not known south of the McIlwraith Range. The third species, the red-necked rail arrives in December in N (earlier in the south). This species is associated with creeks inside dense closed forest. It is significant that the two fruit eating species arrive and nest before the wet season begins, whereas the three ground feeding species appear at the onset of, and breed through, the wet season. Many fruits ripen late in the dry season. Their abundance is important for fruit eaters, which move in flocks, nest in colonies and consume a great quantity of fruit every day. The arrival of the ground feeders is correlated with increase in the activity of the litter fauna. The leaf litter accumulated through the dry season decomposes rapidly in the wet season.

#### Winter visitors

All winter visitors come from south of the region, but there is also much movement within the Peninsula, particularly in the western regions and the South East.

Water birds gather in permanent water holes; many come from the south though some of them are known to breed within the Peninsula. Finches, parrots and doves appear at water holes in large numbers, whereas hawks follow bushfires.

The flock pigeon, cockatiel, budgerigah, black-eared cuckoo and rufous-throated honeyeater appear in SW and some of them reach W or SE in the dry season. The wood-swallows and many honeyeaters, including the banded and white-streaked honeyeaters are probably nomadic. Details of movements here are not fully understood (Keast 1958; 1968).

Among regular migrants from the south, the black-shouldered kite (resident in ESE), nankeen kestrel, peregrine falcon, pallid cuckoo, fan-tailed cuckoo, Horsfield bronze cuckoo, golden bronze cuckoo, the martins, black-faced cuckoo-shrike, rufous songlark, reed warbler, satin flycatcher, black-faced flycatcher, spectacled flycatcher (southern race) and scarlet honeyeater do not appear to breed in the Peninsula proper. Some of them (*e.g.* satin flycatcher) seem to migrate further north while most of them winter within the region. The top-knot pigeon has been observed to fly south in flocks over Cape York (Macgillivray 1917), but its origin is not known. Since it is a highland closed forest species in north Queensland, it is most unlikely to migrate north, particularly beyond Cape York.

The southern migrants, which are also represented by local breeding populations, include the koel, channel-billed cuckoo, rainbow bee-eater, dollar-bird, grey fantail, rufous fantail, leaden flycatcher, spangled drongo and mistletoe bird.

#### Breeding seasons

The species known to breed in the Peninsula are indicated in the Appendix. No species breeds throughout the year in the Peninsula though some (*e.g.* yellow-breasted sunbird) have been recorded to nest in most months. Early collectors' records cited by North (1901-14) and Campbell (1900) suggest that there are some regularities about breeding seasons. The type of habitat appears to influence the breeding season and in migratory species the movement to the breeding area is precisely timed.

Breeding seasons of island birds have been summarised by Kikkawa (1976). The red-tailed tropic-bird, gannets, frigate-birds, noddy, crested tern and sooty tern have seasons differing from island to island or from one year to another. Most terns and land birds lay in late winter to spring, while the Australian pelican, Caspian tern, osprey, sea eagles and varied honeyeater nest in winter.

On the Peninsula water birds generally lay in the wet season, but some (*e.g.* broilga) are known to lay in the dry season as well. Most closed forest birds nest towards the end of the dry season (early summer). Exceptions include the wompoo pigeon laying in July (SE) and the yellow-breasted sunbird with an extended season. In sclerophyll habitats, pardalotes and honeyeaters breed through the winter months and insectivorous birds in spring. Seed eaters (*e.g.* golden-winged parrot, pale-headed rosella, doves and finches) appear to breed after the wet season (autumn).

#### SUMMARY AND CONCLUSIONS

The ornithological history and the distributional records of 366 species of birds known from Cape York Peninsula and adjacent islands north of 16°S are summarized.

The data assembled confirm that the closed forest bird fauna of the Peninsula north of Cooktown (Peninsula proper) is essentially an attenuated Papuan fauna, both biogeographically and ecologically separated from the closed forest fauna south of Cooktown. It is suggested that this fauna is of lowland type, comparable to the lowland closed forest fauna of north Queensland, but in addition shows some adaptation to the monsoon conditions. The only highland closed forest habitat of the Peninsula is found in the McIlwraith Range, where it is restricted in area and does not contain any closed forest endemic element of north Queensland, though one species characteristic of this habitat in eastern Australia occurs there. The closed forest fauna of the Peninsula proper consists of recent colonizers from the Papuan region and during the most recent increases in aridity the McIlwraith Range-Iron Range area acted and still is acting as the major refuge for these species.

The sclerophyll habitats of woodland and forest occupy the greatest part of the Peninsula and the bird fauna in them consists of northern Australian species with some monsoon-adapted elements and migrants from the south. Grassland and low open woodland of the South West region contains a typical southern Gulf fauna and receives nomadic species. Large flocks of water birds are known from this region. Some elements of the closed forest fauna penetrate into sclerophyll habitats from the gallery forest developed along west flowing rivers. The heath contains the only endemic species of the Peninsula, thus supporting a unique association of species.

Much further work is needed to understand the proximate factors of breeding and migration. Ecological associations of species with habitats appear to occur on a small scale in many species and the study of components of various habitats which show mosaic distribution will be important in further elucidating the ecological distribution of birds in Cape York Peninsula.

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## APPENDIX

A list of species and subspecies recorded from north of 16°S on Cape York Peninsula and from adjacent waters. Localities listed separately are the Great Barrier Reef region (GBR), Extreme South East (ESE), South East (SE), East (E), North (N), Torres Strait (TS), West (W) and South West (SW), as defined in Part 1. Species known to breed on the Peninsula are marked with an asterisk (\*).

The species order and vernacular names follow CSIRO (1969), except where a vernacular name is available for the subspecies or where a species has more than one subspecies in the region. The scientific names follow Condon (1975) for the non-passerines, and Schodde (1975) for passerines. The passerine subspecies names follow Storr (1973). Explanations are given where nomenclature varies from that of these authorities.

Species and subspecies	Region							
	GBR	ESE	SE	E	N	TS	W	SW
*Cassowary <i>Casuarus casuarus johnsonii</i>						1		
*Emu <i>Dromaius novaehollandiae</i> subsp. <sup>2</sup>								
Grey-headed albatross <i>Diomedea chrysoptoma</i>	+							
Trinidad petrel <i>Pterodroma arminjoniana heraldica</i>								
*Wedge-tailed shearwater <i>Puffinus pacificus royanus</i>	+							
Wilson storm-petrel <i>Oceanites oceanicus</i>	+							
*Australian pelican <i>Pelecanus c. conspicillatus</i>	+	+	+	+	+	3	+	+
*Red-footed booby <i>Sula sula rubripes</i>	+							
*Masked booby <i>S. dactylatra personata</i>	+							
*Brown booby <i>S. leucogaster plotus</i>	+							
*Darter <i>Anhinga melanogaster rufa</i>	+	+	+	+	+	+	+	+
*Black cormorant <i>Phalacrocorax carbo novaehollandiae</i>	+							
*Little black cormorant <i>P. sulcirostris</i>								
Pied cormorant <i>P. varius</i>	+	+	+	+	+			
Little pied cormorant <i>P. m. melanoleucos</i>	+	+	+	+	+			
*Greater frigate-bird <i>Fregata minor peninsulæ</i>	+							
*Lesser frigate-bird <i>F. a. artel</i>	+	+	+	+	+			
*Red-tailed tropic-bird <i>Phaethon rubricauda roseotincta</i>	+							
White-tailed tropic-bird <i>P. lepturus dorothæe</i>								
*Little grebe <i>Tachybaptus n. novaehollandiae</i>		+	+	+	+			
Hoary-headed grebe <i>Poliiocephalus poliocephalus</i>								
*Great-billed heron <i>Ardea sumatrana</i>		+	+	+	+			
*White-necked heron <i>A. pacifica</i>								
*White-faced heron <i>A. n. novaehollandiae</i>	+	+	+	+	+			
*Pied heron <i>A. picata</i>								
*Mangrove heron <i>Butorides striatus littleri</i>	+	+	+	+	+			
White egret <i>Egretta alba modesta</i>	+	+	+	+	+			
*Little egret <i>E. garzetta nigripes</i>								
Plumed egret <i>E. intermedia plumifera</i>								
*Reef heron <i>E. s. sacra</i>	+	+	+	+	+			
*Nankeen night-heron <i>Nycticorax caledonicus hilli</i>	+	+	+	+	+			
Little bittern <i>Ixobrychus minutus dubius</i>								
*Black bittern <i>Dupetor flavicollis gouldi</i>	+	+	+	+	+			
*Jabiru <i>Nenorhynchus asiaticus australis</i>	+	+	+	+	+			
*White ibis <i>Threskiornis molucca strictipennis</i>								
*Straw-necked ibis <i>T. spinicollis</i>								
*Glossy ibis <i>Plegadis falcinellus</i>								
*Royal spoonbill <i>Platalea regia</i>	+	+	+	+	+			
*Yellow-billed spoonbill <i>P. flavipes</i>								
*Magpie goose <i>Anseranas semipalmata</i>								
Water whistling duck <i>Dendrocygna arcuata australis</i>		+	+	+	+			
Grass whistling duck <i>D. aytoni</i>								
Black swan <i>Cygnus atratus</i>								
*Burdekin duck <i>Tadorna radjah rufitergum</i>								
*Black duck <i>Anas s. superciliosa</i>		+	+	+	+			
Grey teal <i>A. gibberifrons gracilis</i>	4							
Blue-winged shoveler <i>A. r. rhynchositis</i>			+					
Garganey teal <i>A. querquedula</i>	4							
White-eyed duck <i>Aythya a. australis</i>								
Wood duck <i>Chenonetta jubata</i>								
*Green pigmy goose <i>Nettapus pulohellus</i>		+	+	+	+			
White-gullied pigmy goose <i>N. coromandelianus albipennis</i>								
Black-shouldered kite <i>Elanus notatus</i>	+	+	+	+	+			
*Crested hawk <i>Avioeda s. subaristata</i>								
Fork-tailed kite <i>Milvus migrans affinis</i>								
Square-tailed kite <i>Lophototinia isura</i>								
Black-breasted buzzard <i>Hamirostra melanosternon</i>								
*Red-backed sea eagle <i>Haliastur indus girrenera</i>	+	+	+	+	+			
*Whistling eagle <i>H. spheurnus</i>	+	+	+	+	+			
*Grey goshawk <i>Accipiter n. novaehollandiae</i>								
*Australian goshawk <i>A. fasciatus didimus</i>		+	+	+	+			
*Collared sparrowhawk <i>A. cirrhocephalus quassintandus</i>		+	+	+	+			
Red goshawk <i>Erythrotriorchis radiatus</i>	+							
Australian little eagle <i>Hieraetus m. morphoides</i>								
Wedge-tailed eagle <i>Aquila a. audax</i>								
*White-breasted sea eagle <i>Haliaeetus leucogaster</i>	+	+	+	+	+			
Spotted harrier <i>Circus assimilis</i>								
*Swamp harrier <i>C. aeruginosus gouldi</i>	+	+	+	+	+			
*Osprey <i>Pandion haliaetus cristatus</i>	+	+	+	+	+			
Peregrine falcon <i>Falco peregrinus macropus</i>	+	+	+	+	+			



Species and subspecies	GBR	ESE	SE	E	N	TS	W	SW
*Crested tern <i>S. bergii pelecanoides</i>	+	+	+	+	+	+	+	+
*Lesser crested tern <i>S. b. bengalensis</i>	+	+	+	+	+	+	+	+
*Noddy <i>Anous stolidus pileatus</i>	+	+	+	+	+	+	+	+
*White-capped noddy <i>A. m. minutus</i>	+	+	+	+	+	+	+	+
*Red-crowned pigeon <i>Ptilinopus r. regina</i>	+	+	+	+	+	+	+	+
*Purple-crowned pigeon <i>P. s. superbus</i>							+	
*Atherton wompoo pigeon <i>P. magnificus keri</i>				+				
*Cape York wompoo pigeon <i>P. m. assimilis</i>				+			+	
*Torres Strait pigeon <i>Ducula epiorrhhoa melvillensis</i>	+	+	+	+	+	+	+	+
Top-knot pigeon <i>Lopholaimus antarcticus</i>		+	+	+				
White-headed pigeon <i>Columba leucomela</i>			+	+	+			
*Brown pigeon <i>Macropygia amboinensis phasianella</i>		+	+	+	+			
*Bar-shouldered dove <i>Geopelia h. humeralis</i>	+	+	+	+	+	+	+	+
*Peaceful dove <i>G. striata placida</i>		+	+	+	+			
*Diamond dove <i>G. cuneata</i>	+		+	+	+			
*Green-winged pigeon <i>Chalophaps indica rogersi</i> <sup>8</sup>		+				+		
*Common bronzewing <i>Phaps c. challoptera</i>				+			+	
*Crested pigeon <i>Ocyphaps l. lophotes</i>				+	+			
*Squatter pigeon <i>Petrophassa scripta</i>				+	+			
Flock pigeon <i>Phaps histrionica</i>								+
*Rainbow lorikeet <i>Trichoglossus haematodus septentrionalis</i>	+	+	+	+	+	+	+	+
Scaly-breasted lorikeet <i>T. chlorolepidotus</i>			+					
Varied lorikeet <i>Peitteteles versicolor</i>			+	+	+		+	+
*Marshall's fig parrot <i>Psittaculirostris diophthalma marshalli</i>				+				
*Blue-faced fig parrot <i>P. d. macleaniana</i>		+						
*Palm cockatoo <i>Probosciger a. aterrimus</i>				+	+		+	
*Red-tailed black cockatoo <i>Calyptorhynchus m. magnificus</i> <sup>12</sup>		+	+	+	+		+	+
*Sulphur-crested cockatoo <i>Cacatua galerita queenslandica</i> <sup>12</sup>	+	+	+	+	+	+	+	+
*Little corella <i>C. sanguinea normantoni</i>							+	+
*Galah <i>C. r. roseicapilla</i> <sup>13</sup>				+	+		+	+
Cockatiel <i>Nymphicus hollandicus</i>								+
*Red-sided parrot <i>Eolestes voratus macgillivrayi</i>				+				
*Red-cheeked parrot <i>Geoffroyus geoffroyi arvensis</i>				+				
*Red-winged parrot <i>Aprosmictus erythropterus</i> <sup>14</sup>		+	+	+	+		+	+
*King parrot <i>Alisterus scapularis minor</i>		+						
*Pale-headed rosella <i>Platycercus a. adscitus</i>								
*Cape York pale-headed rosella <i>P. adscitus amathusiae</i>				+	+		+	+
*Golden-winged parrot <i>Psephotus chrysopterygius</i>				+	+		+	+
Budgerigah <i>Melopsittacus undulatus</i>								+
Oriental cuckoo <i>Cuculus saturatus</i>		+	+	+	+	+	+	+
Pallid cuckoo <i>C. pallidus</i>		+	+	+	+		+	+
*Brush cuckoo <i>C. v. variolosus</i>		+	+	+	+	+	+	+
*Chestnut-breasted cuckoo <i>C. c. castaneiventris</i>		+	+	+	+		+	+
Fan-tailed cuckoo <i>C. pyrrhophanus prionurus</i>		+	+	+	+		+	+
Black-eared cuckoo <i>Chrysocolaptes ocellatus</i>						+		
Horsfield bronze cuckoo <i>C. basalts</i>		+	+	+	+	+	+	+
Golden bronze cuckoo <i>C. lucidus plagiatus</i>								
*Rufous-breasted bronze cuckoo <i>C. russatus</i>	+	+	+	+	+	+	+	+
Little bronze cuckoo <i>C. malayanus minutillus</i>								+
*Koel <i>Eudynamis scolopacea cyanoocephala</i>		+	+	+	+	+	+	+
*Channel-billed cuckoo <i>Saythrops novaehollandiae</i>		+	+	+	+	+	+	+
*Pheasant coucal <i>Centropus p. phasianinus</i>	+	+	+	+	+	+	+	+
*Rufous owl <i>Ninox rufa marginata</i>		+	+	+	+		+	+
*Barking owl <i>N. c. comivens</i>		+						+
*Cape York barking owl <i>N. c. peninsularis</i>			+	+	+	+	+	+
*Boobook owl <i>N. novaeseelandiae ocellata</i>				+	+	+	+	+
*Red boobook owl <i>N. n. lurida</i>		+						
*Barn owl <i>Tyto alba delicatula</i>							+	+
*Masked owl <i>T. novaehollandiae galei</i>				+	+			
*Sooty owl <i>T. tenebricosa multipunctata</i>		+						
Eastern grass owl <i>T. l. longimembris</i>				+		+		+
*Tawny frogmouth <i>Podargus s. strigoides</i>		+	+					
*Northern tawny frogmouth <i>P. s. phalaenoides</i>				+	+			+
*Papuan frogmouth <i>P. papuensis</i>		+	+	+	+	+	+	+
*Marbled frogmouth <i>P. ocellatus marmoratus</i>				+	+			+
*Owlet-nightjar <i>Aegotheles cristatus leucogaster</i>		+	+	+	+			
*Spotted nightjar <i>Caprimulgus g. guttatus</i>				+	+			+
*White-throated nightjar <i>C. m. mystacalis</i>				+	+			
*Large-tailed nightjar <i>C. macurus yorki</i>		+	+	+	+	+	+	+
Uniform swiftlet <i>Collocalia vanikorensis yorki</i>						+		

Species and subspecies	GBR	ESE	SE	E	N	TS	W	SW
Grey swiftlet <i>C. terraereginae</i>		+		+				
Glossy swiftlet <i>C. esculenta</i>					+	+		
Spine-tailed swift <i>Hirundoapus c. caudacutus</i>		+	+	+	+	+	+	
Fork-tailed swift <i>Apus p. pacificus</i>		+	+	+	+	+	+	+
*Azure kingfisher <i>Alcedo a. amareus</i> <sup>16</sup>		+	+	+				
*Northern azure kingfisher <i>A. a. ruficollaris</i> <sup>15</sup>				+	+	+	+	+
*Little kingfisher <i>Ceyx puellus halli</i>			+		+	+		
*Laughing kookaburra <i>Dacelo n. novaeguineae</i>			+				+	+
*Little kookaburra <i>D. n. minor</i>			+	+	+			
*Blue-winged kookaburra <i>D. l. leachii</i>		+						
*Cape York blue-winged kookaburra <i>D. l. kempii</i>			+	+	+	+	+	+
*Forest kingfisher <i>Halcyon macleayii incincta</i>		+	+			+	+	+
*Red-backed kingfisher <i>H. pyrrhopygia</i>			+	+	+	+	+	+
*Sacred kingfisher <i>H. s. sanata</i>		+	+	+	+	+	+	+
*Mangrove kingfisher <i>H. chloris sordida</i>			+	+	+	+	+	+
*Yellow-billed kingfisher <i>Syma torotoro flavirostris</i>				16	+	+	+	
*White-tailed kingfisher <i>Tanyseptera s. sylvia</i>			+	+	+	+	+	+
*Rainbow bee-eater <i>Merops ornatus</i>		+	+	+	+	+	+	+
*Dollar-bird <i>Eurystomus orientalis pacificus</i>		+	+	+	+	+	+	+
*Noisy pitta <i>Pitta v. versicolor</i>			+	+				
*Cape York noisy pitta <i>P. v. similima</i>		+			+	+	+	+
*Blue-breasted pitta <i>P. erythrogaster macklotti</i>					+	+	+	
*Singing bushlark <i>Mirafra javanica</i>			+					+
Welcome swallow <i>Hirundo neoxena</i>		+	+	+	+	+	+	+
Barn swallow <i>H. rustica guttalis</i>						17		
Eastern swallow <i>H. tahitica javanica</i>						18	18	
Tree-martin <i>Cecropis n. nigricans</i>		+	+	+	+	+	+	+
Fairy martin <i>C. ariel</i>					+	+	+	+
*Australian pipit <i>Anthus novaeseelandiae australis</i>		+	+	+	+	+	+	+
*Black-faced cuckoo-shrike <i>Coracina n. novaehollandiae</i>		+	+	+	+	+	+	+
*Papuan cuckoo-shrike <i>C. papuensis stalkerii</i> <sup>19</sup>		+	+	+	+	+	+	+
*Barred cuckoo-shrike <i>C. l. lineata</i>		+	+	+				
*Cicada-bird <i>C. t. tenuirostris</i>				+	+	+	+	+
*White-winged triller <i>Lalage sueurii tricolor</i>				+	+	+	+	+
*Varied triller <i>L. l. leucocoma</i>		+	+	+	+	+	+	+
*Cape York varied triller <i>L. l. yorki</i>					+	+	+	+
*Northern scrub-robin <i>Drymodes s. supercilialis</i>					+	+	+	+
*Australian ground-thrush <i>Zosterops dauma cuneata</i> <sup>21</sup>		+						
*Northern chowchilla <i>Orthonyx spaldingii</i>		+						
*Grey-crowned babbler <i>Pomatostomus temporalis cornalli</i> <sup>22</sup>		+	+	+	+	+	+	+
*Golden-headed fantail-warbler <i>Cisticola exilis</i>		+		+	+	+	+	+
Streaked grass-warbler <i>C. juncoideus normani</i>							23	
Little grassbird <i>Megalurus gramineus</i>								
*Tawny grassbird <i>M. timoriensis dulotii</i> <sup>22</sup>				+	+	+	+	+
Reed-warbler <i>Acrocephalus arundinaceus</i>				+	+	+	+	+
Rufous songlark <i>Cinclorhynchus mathewsi</i>				+	+	+	+	+
*Lovely wren <i>Malurus lamberti amabilis</i>		+	+	+	+	+	+	+
*Red-backed wren <i>M. melanoccephalus</i>		+	+	+	+	+	+	+
*White-throated warbler <i>Gerygone olivacea flavigaster</i>		+	+	+	+	+	+	+
*Brown warbler <i>G. m. mouki</i>		+						
*Black-throated warbler <i>G. palpebrosa personata</i> <sup>25</sup>		+	+	+	+	+	+	+
*Large-billed warbler <i>G. magnirostris cairnsensis</i> <sup>22</sup>		+	+	+	+	+	+	+
Buff-breasted warbler <i>G. l. levigaster</i>						26		
*Yellow weebill <i>Smicromis brevirostris flavescens</i> <sup>27</sup>							+	+
*Mountain thornbill <i>Acanthiza katherina</i>		+						
*Little scrub-wren <i>Sericornis boccardi</i>				+	+	+	+	+
*Yellow-throated scrub-wren <i>S. citreogularis cairnsi</i> <sup>22</sup>		+						
*Large-billed scrub-wren <i>S. magnirostris viridior</i> <sup>22</sup>		+						
*Fern wren <i>Crateroscelis gutturalis</i>		+						
*Jacky winter <i>Micropsa leucophaea pallida</i> <sup>28</sup>		+	+	+	+			+
*Lemon-breasted flycatcher <i>M. flavigaster terraereginae</i> <sup>22</sup>		+	+	+	+	+	+	+
*Little yellow flycatcher <i>M. g. griseiceps</i>				+	+			
*Mangrove robin <i>Eopsaltria pulverulenta leucura</i>		+	+	+	+	+	+	+
*Grey-headed robin <i>Poecilodryas albipectus cinereifrons</i>		+						
*White-browed robin <i>P. s. superciliosa</i>		+	+	+	+	+	+	+
*Northern yellow robin <i>Eopsaltria australis magnirostris</i> <sup>29</sup>		+	+	+	+	+	+	+
*Pale yellow robin <i>Tregellasia capito nana</i>								
*White-faced robin <i>T. leucops albigularis</i>				+	+			
Grey fantail <i>Rhipidura fuliginosa alisteri</i> <sup>30</sup>		+	+	+	+		+	+
*North Queensland grey fantail <i>R. fuliginosa frerei</i>		+						

Species and subspecies	GBR	ESE	SE	E	N	TS	W	SW
*Gulf grey fantail <i>R. f. phasiana</i>								
Rufous fantail <i>R. r. rufifrons</i> <sup>30</sup>	+	+	+	+	+	+		+
*North Queensland rufous fantail <i>R. r. intermedia</i>		+						
*Gulf rufous fantail <i>R. r. dryas</i>								
*Northern fantail <i>R. rufiventris isura</i>	+	+	+	+	+	+		+
*Willie wagtail <i>R. l. leucophrys</i>	+	+	+	+	+	+		+
*Leaden flycatcher <i>Myiagra r. rubecula</i>	+	+	+	+	+	+		+
Satin flycatcher <i>M. cyanoleuca</i>	+	+	+	+	+	+		+
*Broad-billed flycatcher <i>M. ruficollis kempfi</i> <sup>31</sup>	+							+
*Shining flycatcher <i>M. alecto wardelli</i> <sup>32</sup>	+	+	+	+	+	+		+
*Cape York boat-billed flycatcher <i>Maohaerirhynchus f. flaviventris</i>				+	+			+
*Boat-billed flycatcher <i>M. f. secundus</i>		+	+ <sup>6</sup>					
*Restless flycatcher <i>Myiagra iniqueta nana</i>						+ <sup>33</sup>		+
*Australian pied flycatcher <i>Arses kaupi</i>		+						
*Frig-necked flycatcher <i>A. telescopthalmus lorealis</i>				+	+			+
*Black-faced flycatcher <i>Monarcha melanopsis</i> <sup>34</sup>	+	+	+	+	+			
*Black-winged flycatcher <i>M. frater omeiensis</i>	+	+	+	+	+			
*Spectacled flycatcher <i>M. trivirgatus gouldi</i>		+	+ <sup>35</sup>					+ <sup>35</sup>
*White-bellied flycatcher <i>M. t. albiventris</i>			+	+	+	+		
*White-eared flycatcher <i>M. leucotis</i>		+		+	+			
*Golden whistler <i>Fachycephala pectoralis queenslandica</i> <sup>36</sup>		+						
*Mangrove golden whistler <i>P. melanura robusta</i> <sup>37</sup>								
*Rufous whistler <i>P. r. rufiventris</i>	+	+	+	+	+			+
*Grey whistler <i>P. simplex peninulae</i>	+	+	+	+	+			+
*Grey shrike-thrush <i>Colluricincla harmonica superciliosa</i> <sup>38</sup>						+		+
*Rufous shrike-thrush <i>C. megarhyncha rufogaster</i>	+	+	+	+	+	+		+
*Bower shrike-thrush <i>C. boweri</i>		+						
*Eastern whipbird <i>Psophodes olivaceus lateralis</i>		+						
*Striated sittella <i>Daphoenositta chrysoptera striata</i>			+	+	+			+
*Black tree-creeper <i>Climacteris picummus melanota</i>		+	+	+				+
*Little tree-creeper <i>C. minor</i>		+						
*Mistletoe bird <i>Dicaeum h. hirundinaceum</i>	+	+	+	+	+			+
*Black-headed pardalote <i>Pardalotus striatus uropygialis</i>								+
*Red-browed pardalote <i>P. rubricatus</i>								+
*Yellow-breasted sunbird <i>Nectarinia jugularis frenata</i>	+	+	+	+	+	+		+
*Grey-breasted silveryeye <i>Zosterops lateralis ramsayi</i>		+	+	+				+
*Yellow silveryeye <i>Z. lutea</i>					+			+
*Pale silveryeye <i>Z. citrinella albiventris</i>	+					+		
* <sup>39</sup> Green-backed honeyeater <i>Glycichaera fallax</i>				+				
*Brown honeyeater <i>Lichmera indistincta ouida</i> <sup>22</sup>	+	+			#0	#1		+
*White-streaked honeyeater <i>Trichodere cockerelli</i>		+ <sup>42</sup>	+	+	+	+		+
*Dusky honeyeater <i>Myzomela obscura harterti</i>		+	+	+	+	+		+
*Red-headed honeyeater <i>M. e. erythrocephala</i>	+	+	+	+	+	+		+
Scarlet honeyeater <i>M. s. sanguinolenta</i>	+	+	+	+	+	+		+
*Banded honeyeater <i>Certhionyx pectoralis</i>			+	+	+	+		+
*Graceful honeyeater <i>Meliphaga g. gracilis</i>			+	+	+	+		+
*Southern graceful honeyeater <i>M. g. imitatrix</i>	+	+	+ <sup>43</sup>	+	+	+		+
*Lesser Lewin honeyeater <i>M. notata</i>	+	+	+	+	+	+		+
*Lewin honeyeater <i>M. lewinii</i>	+	+	+	+ <sup>44</sup>	+	+		+
*Yellow honeyeater <i>Lichenostomus flava</i>	+	+	+	+	+	+		+
*Singing honeyeater <i>L. virescens</i>								+
*Varied honeyeater <i>L. v. versicolor</i>	+		+	+	+	+		+
Fuscous honeyeater <i>L. f. fusca</i>								46
*Yellow-tinted honeyeater <i>L. fusca flavescens</i>								+
Yellow-faced honeyeater <i>L. chrysops</i>		+						
*White-gaped honeyeater <i>L. u. whitecolor</i>		+						+
*Tawny-breasted honeyeater <i>Xanthotis flaviventris filigera</i>					+	+		+
*Macleay honeyeater <i>X. macleayana</i>	+	+	+ <sup>43</sup>	+	+	+		+
*Bridled honeyeater <i>Lichenostomus frenatus</i>		+						
*White-throated honeyeater <i>Meliphreptus albugularis</i>		+	+	+	+	+		+
*Golden-backed honeyeater <i>M. gularis laetior</i>			+					+
*Blue-faced honeyeater <i>Entomozon c. cyanotis</i>	+	+	+	+	+	+		+
*Little friar-bird <i>Philemon c. citreogularis</i>	+	+	+	+	+	+		+
*Helmeted friar-bird <i>P. bucerotides yorki</i>	+	+	+	+	+	+		+
*Silver-crowned friar-bird <i>P. argenteiceps kempfi</i>	+	+	+	+	+	+		+
*Noisy friar-bird <i>P. corniculatus</i>	+	+	+	+	+	+		+
*Bar-breasted honeyeater <i>Ramsayornis f. fasciatus</i>				+	+	+		+
*Brown-backed honeyeater <i>R. f. modestus</i>	+	+	+	+	+	+		+
*Rufous-banded honeyeater <i>Conopophila albugularis yorki</i>								+
Rufous-throated honeyeater <i>C. rufogularis</i>		+						+



Species and subspecies	GBR	ESE	SE	E	N	TS	W	SW
*Eastern spinebill <i>Acanthorhynchus tenuirostris cairnsensis</i>		+						
*Noisy miner <i>Manorina melanoccephala</i>			+					
*Pale crimson finch <i>Neochmia phaeton evangelidae</i>				+			+	+
*Star finch <i>N. ruficauda clarescens</i>				+			+	+
*Red-browed finch <i>Emblema temporalis minor</i> <sup>46</sup>		+	+	+	+		+	+
*Blue-faced finch <i>Erythrura trichroa sigillifera</i>	+	+						
*Gouldian finch <i>E. gouldiae</i>			+				+	+
*Masked finch <i>Poephila personata leucotis</i>			+	+			+	+
*Black-throated finch <i>P. cincta atropygialis</i> <sup>47</sup>	+	+	+		+		+	+
*Banded finch <i>P. b. bihenovii</i>			+				+	+
*Chestnut-breasted finch <i>Lonchura c. castaneothorax</i>	+	+	+	+	+	+	+	+
*Shining starling <i>Aplonis m. metallica</i>	+	+	+	+	+	+	+	+
*Olive-backed oriole <i>Oriolus sagittatus</i>	+	+	+	+	+	+	+	+
*Yellow oriole <i>O. flavocinctus kingi</i>	+	+	+	+	+	+	+	+
*Yellow figbird <i>Sphecotheres viridis flaviventris</i>	+	+	+	+	+	+	+	+
*Spangled drongo <i>Dicrurus hottentottus bracteatus</i>	+	+	+	+	+	+	+	+
*Magpie lark <i>Grallina cyanoleuca</i>			+	+	+		+	+
*Apostle bird <i>Struthidea cinerea</i>			+				+	+
*White-breasted wood-swallow <i>Artamus leucorhynchus</i>	+	+	+	+	+	+	+	+
Masked wood-swallow <i>A. personatus</i>								+
White-browed wood-swallow <i>A. superciliosus</i>								+
*Black-faced wood-swallow <i>A. cinereus albiventris</i>			+	+	+		+	+
Little wood-swallow <i>A. minor</i>			+				+	+
*Pied currawong <i>Strepera g. graculina</i>		+		+	+			
*Peninsula pied currawong <i>S. g. magnirostris</i>			+				+	
*Pied butcher-bird <i>Craictus nigrogularis</i>			+	+			+	+
*Black butcher-bird <i>C. q. quyi</i>	+		+	+			+	+
*Dimorphic black butcher-bird <i>C. q. rufescens</i>		+	+					
*Black-backed butcher-bird <i>C. mentalis</i>			+	+	+		+	+
*Black-backed magpie <i>Gymnorhina t. tibicen</i>			+	+				+
*Spotted catbird <i>Ailuroedus melanotis</i>				+				+
*Tooth-billed bower-bird <i>A. dentirostris</i>			+					
*Golden bower-bird <i>Prionodura newtoniana</i>			+					
*Satin bower-bird <i>Ptilonorhynchus violaceus minor</i>		+						
*Fawn-breasted bower-bird <i>Chlamydera cerviniventris</i>			+	+	+			
*Great bower-bird <i>C. nuchalis orientalis</i>			+	+			+	+
*Manucode <i>Manucodia keradrenti gouldii</i>	+		+	+				
*Victoria rifle-bird <i>Ptiloris victoriae</i>		+						
*Magnificent rifle-bird <i>P. magnificentus alberti</i>	+		+	+	+		+	+
*Australian crow <i>Corvus orru salvadorii</i>		+	+	+	+		+	+

## NOTES

1. The northernmost record at Heathlands requires confirmation.
2. Subspecies not determined.
3. Recorded from Channel Rock (Macgillivray 1914).
4. Storr (1973) considers Macgillivray's record of the grey teal on Turtle Head Island possibly as a Garganey teal.
5. Sight record at Weipa in July 1976 (P. O'Reilly, pers. comm.)
6. The subspecies at Mt. Webb, north of Cooktown, not determined.
7. The subspecies in rain forest patches immediately north of Cooktown (McIvor River, Mt. Webb) not determined.
8. The north Queensland subspecies is adopted following Mathews (1946).
9. Collected by M'Lennan at Peak Point in February 1912 (Macgillivray 1914).
10. Recorded at Weipa in July 1976 by P. O'Reilly (pers. comm.).
11. Reported from the Mitchell River in the dry season by Domrow (1967).
12. The nominate race is adopted.
13. The northern race of Mathews (1912), (Forshaw 1968).
14. Distribution of two races adopted by Condon (1975) is not clear in region.

15. See Schodde and Mason (1976).
16. Records at Mt. Webb and McIvor River require confirmation.
17. A record in Condon (1967).
18. Doubtful records (see text (Part I) and Storr (1973)).
19. A small, white-breasted race of north Queensland (Mathews (1912), in Galbraith (1969)).
20. The race in rain forest patches north of Cooktown not determined.
21. The north Queensland race of Mathews (1890).
22. The north Queensland race of Mathews (1912).
23. Record at Weipa (Feb. 1976) not confirmed.
24. A record at Iron Range (see Trounson 1975).
25. The throat of the mature male is pale brown at Ayton in ESE (Hall 1974) and variable from brownish-black to whitish at the Lower Edward River in SW (Thomson 1935). In other parts of the region it is generally characteristic of the race.
26. The record of Johnson and Hooper (1973) requires confirmation.
27. The northern race.
28. The northern race of De Vis (1884).
29. The north Queensland race of Gould (1869).
30. The wintering races in the region.
31. The Cape York race of Mathews (1912).
32. The Queensland race of Mathews (1911).
33. Recorded by Ingram (1976), the subspecies not determined.
34. Races not clear.
35. The northernmost record of wintering birds at Blackwater Creek in SE (12 km north of Hopevale) and Eleven-mile Scrub (18 km north of Moreton) in central Peninsula (W).
36. The north Queensland race of Reichenow (1899).
37. The Cape York race of Masters (1876).
38. The Cape York race of Masters (1876), considered closer to *brunnea* than to the nominate race (Macdonald 1968).
39. The population is resident but breeding has not been recorded.
40. The northernmost record at Heathlands, eight birds banded in July 1975.
41. Recorded from Saibal (Ingram 1976).
42. The southernmost record at Shipton's Flat, two males collected in Sept. 1948 (Mack 1953).
43. The northernmost record at Mt. Webb, north of Cooktown.
44. Disjunct distribution to McIlwraith Range.
45. Recorded in the wet season at the Mitchell River (Domrow 1967).
46. The north Queensland race of Campbell (1901).
47. For other subspecies see Zann (1976).

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## FURTHER NOTES ON THE BIRDS OF FRASER ISLAND AND ADJACENT WATERS

D.H. BARRY and D.P. VERNON

### ABSTRACT

Literature and specimen records subsequent to our earlier paper (Vernon and Barry 1972) are presented. Twenty three new species are added to the list for Fraser Island, bringing the total known species to 223.

### INTRODUCTION

A list of 200 birds known to occur on Fraser Island was compiled by Vernon and Barry (1972). Since then, a number of additions have been made by different observers.

Zillman (1972) provided six additional species in his list of 82 species. Perkins (1973) cited two further species, including the grey-tailed tattler which was incorrectly cited by Vernon and Barry (1972).

The present list includes all literature and specimen records known to us since Vernon and Barry's (1972) list. It brings the number of species for Fraser Island to 223, compared with 254 from Stradbroke Island (Vernon and Martin 1975a) and 126 from Moreton Island (Vernon and Martin 1975b; Barry and Lear 1976).

Nomenclature follows CSIRO (1969). Registered numbers are quoted for specimens preserved in the Queensland Museum, followed by sex, if known, date of collection and the name of the collector where necessary our individual observations are indicated with initials (D.B., or D.V.). Records additional to those published in our 1972 paper are indicated by an asterisk (\*). Specimens are cabinet skins unless otherwise stated.

### LIST OF SPECIES AND NOTES

- \*Giant petrel *Macronectes giganteus*- On 27 October 1970, a banded dark phase bird landed on the deck of a trawler off Sandy Cape. The bird was released, but its band was removed by a fisherman who forwarded it to C.J. Limpus (pers. comm.). Information from the Paris Museum revealed that it had been banded as a juvenile on 6 December 1969 on Possession Island, Crozet Group, Sub-antarctic. It had previously been found at Tweed Heads, New South Wales, on 19 August 1970 and taken to D.H. Fleay at West Burleigh, Queensland, who released it one week later after it regained condition.

- \*Black-winged petrel *Pterodroma nigripennis* - QM016399, spirit specimen, 8 January 1976, Filmer. This beach-washed specimen was found 2 km south of Eurong Beach.
- \*Thin-billed prion *Pachyptila belcheri* - QM015548, September 1973, Anon. This specimen was found alive between Eurong Beach and Hook Point, but died later (Vernon and Martin 1974).
- Short-tailed shearwater *Puffinus tenuirostris* - QM015880, 1974, Anon. This head was collected from Ocean Beach.
- Australian gannet *Morus serrator* - QM015881, 1974, Anon. Head only, collected from Ocean Beach. Occasionally observed out to sea off both coastlines.
- \*Little egret *Egretta garzetta* - Zillman (1972), Perkins (1973).
- \*Reef heron *Egretta sacra* - Zillman (1972).
- Nankeen night heron *Nycticorax caledonicus* - QM013978, December 1972. Feathers only, D.B. Several secondary wing feathers were collected in a *Melaleuca quinquenervia* swamp on the southeastern edge of Coomboo Lake. Two resting birds were flushed from trees in the area on several occasions.
- \*Black-breasted quail *Turnix melanogaster* - QM014233, portions of egg shells, 25 December 1972. D.B. collected the egg shells from a clutch of four eggs which probably hatched on the above date. The nest was under low herbage in *Casuarina littoralis*/*Eucalyptus signata* open woodland with a low shrub and forb layer. D.V. noted a small group of dark-chested quail sheltering under herbage at Ungowa in June 1962 which seem most likely to be attributable to this species.
- \*Japanese snipe *Gallinago hardwickii* - Three birds were observed by D.B. in an open *Restio pallens* swamp on the north-west edge of Coomboo Lake in December 1973, where they remained for several days. When flushed they flew with a strong, low, direct flight, curved across the lake and returned to the swamp.
- \*Greenshank *Tringa nebularia* - A small flock was sighted by D.B. on 9 January 1973 feeding on the mud at the edge of the main channel at Puthoo Dump.
- Grey-tailed tattler *Tringa brevipes* - QM013975, head and neck only, 30 December 1972, female, D.B. One of a pair feeding on mud at the water's edge below mangroves at Wathumba. Perkins (1973) also observed two at Snout Point.
- \*Wandering tattler *Tringa incana* - QM013974, 18 July 1972, D.B. One was collected from amongst rocks on Ocean Beach, about 3 km north of Happy Valley. QM09262 is now to be referred to this species: it was previously incorrectly identified as the grey-tailed tattler.

- \*Terek sandpiper *Xenus cinereus* - May 1975, Corben. A flock of five birds observed near the mouth of Woolgoolbva Creek (pers. comm.).
- Sharp-tailed sandpiper *Calidris acuminata* - QM013979, spirit specimen, 9 January 1973, D.B. This specimen was one of a pair which were feeding on the salt marsh just inland from Puthoo Dump. Flocks were also seen on Ocean Beach.
- \*Sanderling *Calidris alba* - Two female specimens were collected at Sandy Cape by McGillivray, 20 April 1844 (Hindwood 1944; Storr 1973).
- \*Avocet *Recurvirostra novaehollandiae* - A flock of 23 was observed south of Eurong Beach, May 1975, Corben (pers. comm.).
- \*Asiatic common tern *Sterna hirundo* - Perkins (1973).
- \*Black-naped tern *Sterna sumatrana* - Zillman (1972).
- Lesser crested tern *Sterna bengalensis* - QM013971, 22 July 1972, D.B. One of a small flock which flew along the ocean edge just south of Woralie Creek. It has also been observed at Ocean Beach.
- \*White-capped noddy *Anous minutus* - QM013972, 5 January 1973; QM013973, 11 January 1973, D.B. The first specimen was collected from the beach just south of the mouth of Woralie Creek and the second specimen was found freshly dead on Eurong Beach. This confirms *Anous* sp. (Makin 1968), cited by Vernon and Barry (1972).
- \*White noddy *Gygis alba* - A specimen was found alive at Torquay, Queensland, on 10 May 1976 and taken to W. Dunmall at Urimbirra Park zoo at Torquay, Queensland. It died the following day and was donated to the Queensland Museum, QM016531. Another live specimen was found in a small boat on Hervey Bay on 13 May 1976 and was also taken to W. Dunmall but this specimen was not retained.
- \*Red-tailed black cockatoo *Calyptorhynchus banksi* - Zillman (1972).
- Ground parrot *Pezoporus wallicus* - 4 January 1973. One was flushed by D.B. from open *Restio pallens* swamp on the edge of Coomboo Lake. Despite heavy rain a good view was obtained as it circled at about 10-15m away before landing. This appears to be the northernmost record for the species.
- Horsfield bronze cuckoo *Chrysococcyx basalis* - May 1975, Corben, south of Second Creek (pers. comm.). This confirms Makin (1968), cited by Vernon and Barry (1972).
- \*Masked owl *Tyto novaehollandiae* - QM013977, 23 December 1972, D.B. A secondary feather was found in forest of *Syncaerpia hillii*/

*Eucalyptus pilularis*/*Tristania conferta* with broken canopy and thick regenerating undergrowth, about 1.5 km north of Coomboo Lake.

Tawny frogmouth *Podargus strigoides* - QM014314, 23 December 1972, D.B. A feather was found near that of the feather of the masked owl.

White-throated nightjar *Eurostopodus mystacalis* - QM013976, 28 July 1972, D.B. A secondary wing feather was found by D.R. Anderson in a clump of *Banksia integrifolia* behind the fore-dunes at Ocean Lake.

\*Reed-warbler *Acrocephalus stentoreus* - May 1975, Corben, Lake Jennings (pers. comm.).

Variegated wren *Malurus lamberti* - A male and a group of females and/or drab-plumaged males were observed by D.B. amongst wet heath, including *Banksia robur*, on the western edge of Ocean Lake on 23 December 1972, and another sighting of birds was also made by D.B. in dry heath on the eastern edge of Coomboo Lake, December 1973. This confirms the doubtful record in Vernon and Barry (1972).

\*Brown warbler *Gerygone mouki* - Zillman (1972), Perkins (1973).

\*Diamond firetail *Emblema guttata* - A small flock was observed for several days by M. and A. Hersom in the vicinity of the Sandy Cape Lighthouse during 1969 (pers. comm.). This is a substantial eastern extension of range, however it is also supported by the observation of a single bird 5 km south of Noosaville on 7 August 1976 (G.R. Beruldsen, pers. comm.).

\*Little wood-swallow *Artamus minor* - May 1975, Corben, Lake Jennings (pers. comm.).

\*Pied currawong *Strepera graculina* - Zillman (1972), Perkins (1973).

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## MOSS AND FUNGUS IN NEST CONSTRUCTION

A.B. CRIBB

In light rain forest of south eastern Queensland, logs with a rotten surface commonly support a rich growth of the moss *Rhizogonium spiniforme*. During the Queensland Naturalists' Club excursion to the Cooran Tableland (26°15'S, 152°49'E), 1-3 May 1976, Mr. W.D. McKenzie discovered an abandoned, unidentified, cup-shaped nest approximately 8 cm in diameter on such a log. The greater part of the nest, including the lining, was constructed from the *Rhizogonium* setae (capsule stalks) which, even after disappearance of the capsule, showed considerable resistance to being plucked from the plant. A layer of horse-hair fungus *Marasmius crinisequi* mixed with a few leafy fragments of mosses formed the outer part of the nest. The black horse-hair-like rhizomorphs of this fungus may commonly be seen attached to dead twigs in rain forests and, at times, produce minute, mushroom-like fruiting bodies with caps no more than 3 mm across.

Pendulous, side-entrance nests in south Queensland rain forests, believed to belong to the yellow-throated scrub-wren *Sericornis lathamii*, are commonly built largely of horse-hair fungus mixed

with mosses and twigs. Chisholm (1969) noted that the yellow-throated scrub-wren is sometimes called the "Black-nest bird" because it builds its nest of black rootlets. Horse-hair fungus could be mistaken for roots, and it is interesting to speculate whether some nesting material, reported in the past as roots, was probably of fungal origin.

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### EDITOR'S NOTE ON THE WHITE PHASE OF THE REEF HERON IN SOUTHERN AUSTRALIA

A recent paper in this journal (McKean, Gill and Lewis 1976, The Sunbird 7 :20-21) reported a sighting of the white phase of the reef heron *Egretta sacra* near Bateman's Bay, New South Wales. The authors enquired whether others had been observed at high latitudes on Australia's east coast.

Wayne Longmore has drawn my attention to an unpublished observation he made on 10 September 1966 of a single white phase reef heron on rocks about 30 m off-shore slightly north of Mollymook, near Ulladulla, New South Wales (35°20'S, 150°29'E).

John McKean too has seen another, or perhaps the same, white phase reef heron at Narooma, New South Wales (36°13'S, 150°09'E) on 27 June 1976. He has also seen a reference to the white phase reef heron occurring in Tasmania (W.H.D. Le Souëf 1908, 'Wildlife in Australia', Melbourne: Whitcombe and Tombs Ltd pp.210-211).

John McKean notes that he had overlooked a typiste's error in the date for the original observation : it was made on 29 June 1975, not 1965.