

BIRDS OF THE NEGARA RIVER BASIN, SOUTH KALIMANTAN, INDONESIA

by

Bas van Balen & Crawford Prentice

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Summary

In January 1989 the wetlands of the Negara and lower Barito river basins (South Kalimantan) were surveyed in order to assess their importance for the conservation of birds. In particular during the last twenty years, logging, reclamation for agriculture and uncontrolled hunting under a growing human population have caused the degradation of these once very rich habitats and subsequently the drastic impoverishment of its bird communities. A total of less than 150 bird species was found. The bird communities of eight habitat types are described.

Recommendations are given for the urgent conservation of areas selected amongst the little that is left.

Introduction

The lower Barito and Negara river basins were reported to sustain extensive freshwater swamps and, comprising c 480,000 ha, considered floristically the most important of their kind in Kalimantan (Scott 1989). In the 1970s the wetlands, which boast a wide variety of waterbirds, were considered as almost certainly the richest in Kalimantan (Holmes & Burton 1987), but detailed surveys to investigate their ornithological significance and to determine possible reserve boundaries had not been carried out. Reclamation schemes and drainage projects, commercial logging, and intensive traditional use (fishing, reed cutting and bird trapping) in the marginal areas have undoubtedly a significant impact on the natural ecosystem. Despite the serious degradation of the habitats, a bird survey was considered worthwhile.

An inventory of the avifauna of the swamps was conducted by the authors in the period 9-26 January 1989. The inventory formed part of a general survey of the area carried out by the Asian Wetland Bureau (Prentice *et al.* 1989; Chairuddin 1990; Giesen 1990; Hadiatma & Kusumadjaya 1990; Klepper & Asfihani 1990). All observations reported below are those of the authors, unless stated otherwise.

Ornithological surveys in the area

Historically, the Barito drainage, in particular the Banjarmasin region, has been extensively surveyed and more collections have been made here than anywhere in Kalimantan. Smythies (1957) listed twelve naturalists who had been collecting in the current project area between 1836 and 1931, of which a few are mentioned in the present paper. Apparently no ornithological surveys were undertaken in the area between 1931 and 1974, when D.A. Holmes visited the Binuang region during 5-20 December 1974; he again visited the region north to Amuntai, Alabio polder, Bangkau lake and the Negara swamps during 16-24 November 1978. Many important records by Holmes are listed in Holmes & Burton (1987) and Scott (1989). Other observers in recent years are W. Giesen in 1988-89 and G. Davison in January 1995.

Study area

Located in the province of South Kalimantan, north from Banjarmasin to Tanjung, the area comprises mainly the alluvial plain of the Negara river (a tributary of the Barito river), which forms a complex network of levees and back swamps, supporting the densest rural population of Kalimantan (Scott 1989). Geographical coordinates are 2°00' 3°15'S, 114°20' 115°25'E. Detailed descriptions of the area are given in Zieren *et al.* (1990). Major habitat types found in the Barito basin are described below.

1. Peat swamp forest

The fringe of the peat swamp forest at Sambujur in the northwest and the forest west of Pulau Pinang, north west of Binuang, were surveyed. The latter was more thoroughly surveyed and was penetrated into the heart of the block, *ca.* 20 km due west. The forest at Sambujur was seriously degraded in the area covered, with heavily logged mixed peat swamp in the interior and *Melaleuca* dominated forest along its south eastern edge. The Pulau Pinang forest was also heavily degraded, progressing from *Melaleuca* and *Combretocarpus* fire seres to heavily logged mixed peat swamp forest. It was apparent that the centre of the forest was as devastated as its fringes, with local variations in habitat quality from clearings to *Pandanus* thickets and occasional stands of fairly large trees.

2. Riparian forest

This habitat was surveyed at seven localities: i) Paminggir river, between Paminggir and Sapala (by day and night); ii) Barito river, between Jenanas and Paminggir (superficially surveyed); iii) Balangan river, between Amuntai and a river junction west of Lampihong; iv) Negara river, between Margasari Hulu and Puting river; v) Tapin river, from its confluence with the Negara to the impassable area south of its junction with Tabirai river (including nocturnal survey); vi) patches along Gamuan river (tributary of Tabirai river); vii) patches along Kajang river (tributary of Tapin river). The condition of the habitat varied markedly, but no undisturbed forest was seen. The area with the tallest remaining trees lay between the Paminggir and Barito rivers, but cattle were being grazed below the trees locally and tree cutting was in progress. The forest along the Balangan river locally had some large trees remaining, but extensive settlements and cultivations restricted it to a very thin fringe.

One area of severely degraded riparian forest was encountered on the Negara river in the vicinity of Jayau river (east bank of Negara river) Its bird community was similar to that encountered along the Tapin river, where extensive remnants of logged riparian forest line the river. Virtually no large trees remained, although the resulting low stature forest is fairly unfragmented in certain areas, such as south of the junction with Tabirai river. The remnants along the Kajang and Gamuan rivers were highly fragmented and of little interest.

3. *Melaleuca/Combretocarpus rotundatus* Swamp forest

Melaleuca cajuputi forest is relatively widespread throughout the project area and was covered superficially in a number of locations. More intensive coverage was achieved on the Puting river (south of Margasari), at Sambujur along the Tapin river and the canal joining it south east of the Kajang river, and on the eastern fringe of the peat swamp at Pulau Pinang as a zone between the *Melaleuca* and mixed peat swamp forests. The condition of the *Melaleuca cajuputi* forest varied from dense stands of young trees, less than 4 m tall, to open logged forest of mature trees of up to 10 m tall. The *Combretocarpus rotundatus* "forest" consisted of a very sparse growth of trees up to 5 m tall with a swampy fern (mainly *Stenochlaena palustris* and *Blechnum indicum*) and sedge association at ground level. Both vegetation types are considered to be fire induced and have a greatly impoverished flora (Giesen 1990).

4. Open swamps

The vegetation communities of the open swamps were complex and margins between different communities were not always clearly defined. Thus open water, submerged vegetation, floating vegetation, low emergent sedges, tall *Phragmites* and shrubs (eg. *Mimosa*) formed a complex of habitats with pronounced local differences. Three habitat types can be distinguished:

4.1 Immersed sedge and grasslands

Open swamps of this type cover much of the project area and were surveyed by boat. The main swamp areas visited were: a). Danau Bangkai and environs (east of Negara); b). Alabio polder; c). Danau Panggang; d). Danau Maningiti; e). swamps along Paminggir river; f). swamps around Sambujur; g). swamps around Awang river (east of Amuntai); h). swamps southeast of Tapin and Tabirai rivers junction. Fishing, reed collection and water buffalo grazing are locally intensive land uses in this habitat.

4.2 Immersed sedge and grasslands with *Mimosa* shrubs See 4.1 for coverage and condition.

4.3 Aquatic vegetation (submerged, floating, *kumpai*)

Whilst interspersed with other open swamp habitats (see 4.1), the principal areas surveyed were: a). Danau Bangkai and environs; b). Alabio polder; c). Danau Panggang; d). Danau Maningiti; e). Danau Bitin. Some areas contained a dense carpet, two or more feet thick, of Water Hyacinth *Eichhornia crassipes* (e.g. Danau Bitin), other areas had dense submerged weed (e.g., Danau Maningiti/Panggang) or floating lilies (pans of Alabio polder).

5. Open water bodies

Relatively few substantial open water bodies were encountered, the principal ones being Danau Bangkau, dotted with "islands" of floating vegetation, Danau Panggang, and river courses which varied from being wide and relatively fast moving (Barito and Balangan rivers) to narrow channels through open swamps and riverine forest.

6. Ladang/rubber plantations

Fruit plantations were encountered on dry ground along the northern edge of Alabio polder. One such plantation was near Batumandi, situated in a sawah area on Batumandi river. An overgrown rubber plantation adjacent to Balangan river (near Lampihong) was also visited. The fruit plantation on Batumandi river consisted of mature fruit trees (e.g., rambutan, mango, jambu air, jambu batu) with some herbaceous undergrowth. The rubber plantation was overgrown with secondary growth. Both had small streams passing through them.

7. Ricefields

Although ricefields are widespread in the region, they were surveyed in relatively few localities, the main areas being: a), on the road from Martapura to Amuntai; b), along the Wang river (near Amuntai); c), along the Batumandi river; d), along the Puting river (south of Margasari), e), around Kalumpang (Tabirai river). Most of the rice appeared to be in a fairly early growing phase, although not all fields were flooded.

8. Settlements

Numerous settlements exist throughout the Negara rivers, from isolated clusters of houses out in the centre of the open swamps to continuous ribbon development along the northern edge of Alabio polder and major townships such as Negara and Amuntai. The settlements often had associated coconuts, fruit trees, at least in the riparian areas, and banana trees lining water courses

.Methods

It was necessary to cover as extensive an area as possible, taking in all principal habitat types in the fifteen days available for fieldwork. The short time available precluded any detailed study using mistnets, or any detailed quantitative censuses.

Open habitats were covered by *klotok* (a large shallow draught boat), the observer standing on the roof and recording every bird seen along a route that covered as much of the swamps as possible. Narrow channels were negotiated by the much smaller and less stable *ces* or *jukung* which were less suitable for observation. Riparian forest was covered by travelling slowly along rivers, sitting in the boat alongside or within the forest recording species on sound as well as sighting, and by walking

through the forest. Peat swamp forest was covered from small *sampans* which were paddled or poled along the narrow waterways within the forest. Night observations using torches were made along the Paminggir and Tapin rivers while searching for crocodiles, and by sound while camping out near *Melaleuca*, riparian and peat swamp forest; unknown calls were recorded for later identification.

Results

Accounts of the bird communities found in the different habitats of the area are given below. Comparisons are made with similar habitats on Sumatra and Kalimantan. The detailed distribution and abundance of species in different habitats is given in Appendix 1.

1. Peat swamp forest

Total of 77 species was recorded in peat swamp forest, including nine species in edge habitats and six aerial species. Twenty species were exclusive to this habitat, including most of the woodpeckers seen in the project area. Other families that were well represented are the cuckoos and cuckoo shrikes, but the dearth of primary forest birds, such as broadbills, trogons, hornbills, bulbuls and babblers, and, conversely, the abundance of secondary growth species (e.g.. Common Iora *Aegithina tiphia*, Striped Tit babbler *Macronous gularis*, Pied Fantail *Rhipidura javanica*) indicate an impoverished community due to habitat degradation. Only two species of owls were heard calling at night. In comparison Nash & Nash (1985) recorded 136 species of bird in the also severely degraded peat swamp forest and canal system in the Padang Sugihan wildlife reserve (South Sumatra), of which 34 species were encountered exclusively to this habitat.

2. Riparian forest

Total of 69 species was recorded, of which 8 are aerial and 21 are edge habitat species. Coverage was relatively short in duration (although extensive), but even so the total of 69 species is remarkably low for what is generally regarded as a habitat with rich fauna. For instance Nash & Nash (1986,1988) recorded 160 species (22 exclusive) in riparian and alluvial swamp forest and along peat basin margins in Tanjung Puting National Park (Central Kalimantan).

Twelve species were found only in riparian forest during the present survey. Some of these are apparently restricted to relatively undisturbed forest, such as the Asian Pied Hombill *Anthracoceros albirostris* and Hill Mynah *Gracula religiosa*. Local differences within this habitat were noticed in the occurrence of e.g. Blue eared Kingfishers *Alcedo meninting*, with a high density only along the Balangan river. The total absence of Straw headed Bulbul *Pycnonotus zeylanicus* and the scarcity of Black and red Broadbills *Cymbirhynchus macrorhynchos* is remarkable, both widespread and highly typical of riparian habitats.

3. *Melaleuccr'**Combretocarpus rotundatus* Swamp forest

A total of 62 species was recorded of which a high proportion were edge habitat (24) and aerial (7) species. Three species, all kingfishers, were only found in this habitat, but cannot be said to be typical of it. Nash & Nash (1985) recorded 98 species in *Melaleuca* forest in Padang Sugihan of which only 8 were confined to that habitat.

A small number of passerine species appeared to dominate, all edge habitats and were typical of disturbed areas: Striped Tit babbler, Ashy Tailorbird *Orthotomus ruficeps*, Flyeater *Gerygone sulphurea*, Pied Fantail, Common Iora, Brown throated Sunbird *Anthreptes malacensis* and Scarlet headed Flowerpecker *Dicaeum trochileum*. A number of waterbirds occurred only in the peripheries and a variety of woodpeckers were seen in the more open mature *Melaleuca* forest, but not in younger dense formations.

4. Open swamps

A total of 56 species was recorded in the open swamps, of which seven are aerial. Nash & Nash (1986, 1988) noted 61 species in grass swamp in Tanjung Puting, although this includes species found in shrubs and standing dead trees

Hérons were well represented, with 8 species. The abundance of pond herons was striking, especially in areas being used for buffalo grazing. Cattle Egret *Bubulcus ibis* was also abundant in the vicinity of water buffalo. Plumed Egret *Egretta intermedia* was widespread in small numbers, while Great Cismorodius *albus* and Little Egret *Egretta garzetta* were scarce and local. The three species of bittern were widespread. Black *Ixobrychus flavicollis* and Yellow *I. sinensis* being abundant where taller vegetation occurred (e.g. in Phragmites swamps). Roosts of pond herons and egrets were located in several areas.

Three members of the rail family were common. Despite thorough scrutinizing of all moorhens seen, no Dusky Moorhen *Gallinula tenebrosa* was seen, although breeding of this species was reported for Bangkau lake by Grabowsky (1885) in April. The absence of sightings of Slaty breasted Rail *Gallirallus striatus* (though probably heard once) is surprising in view of Holmes & Burton (1987) reporting the species "as common in the swampy areas of the Barito". The Comb crested Jacana *Irediparra gallinacea* was seen in mixed emergent/floating vegetation communities, where certain other waterbirds such as Whiskered *Chlidonias hybridus* and White winged Terns *C. leucopterus* were also present.

Both Greater *Centropus sinensis* and Lesser Coucal *C. bengalensis* were seen where taller vegetation occurred and the Stork billed Kingfisher *Pelargopsis capensis* was found where riverine forest or plantations occurred adjacent to the swamps. Otherwise there was a noticeable lack of kingfishers in the open swamps, which was confirmed by G. Davison (*in litt.*) in January 1995. Most of the common passerines were seen regularly where taller cover occurred.

Lesser Adjutant *Leptoptilos javanicus* was widespread, especially where tall trees remained near the swamps. Wandering Treeducks *Dendrocygna arcuata* were abundant; though many treeducks remained unidentified, Lesser Treeducks *D. javanica* were also seen. Cotton Pygmy Goose *Nettapus coromandelianus* was uncommon, and seemed to prefer the more enclosed waterways. A number of

species were missed in the open swamps with aquatic vegetation, most notably the coucals and several passerines. Numbers of egrets were lower in this habitat, and they were not found to roost here.

5. Open water bodies

Relatively few species were actually seen to be using (as opposed to flying over) open water bodies, and are all edge or aerial species. Oriental Darter *Anhinga melanogaster* and Cotton Pygmy Goose preferred rivers flanked by riparian forest, while the treeducks and teals were found in more open swamps (preferring vegetated swamp to open water). Some of the raptors and both tern species require open water for foraging.

Five species of shorebirds were recorded on muddy banks of waterways, and in particular alongside a canal joining the Tapin river. Two of these, the Wood *Tringa glareola* and Common Sandpiper *Actitis hypoleucos*, were also found in other habitats.

6. Ladang/Rubber plantations

Forty species were recorded, including five aerial and 14 edge species. The passerine community contained species in common with other secondary habitats, while Abbott's Babbler *Trichastoma abbotti*, Little Spiderhunter *Arachnothera longirostra* and Java Sparrow *Padda oryzivora* were seen only in these cultivations. Hooded Pitta *Pitta sordida* appeared to be not uncommon with several birds calling in both fruit and rubber plantations.

7. Ricefields

A total of 42 species was recorded, amongst which the ardeids were well represented with nine species.

8. Settlements

A total of 46 species was recorded, of which nine are aerial, Brahminy Kites *Haliastur indus* scavenge along waterways and Black shouldered Kites *Elanus caeruleus* use the associated trees. A number of rails occurred incidentally around villages located in marshes. Nine species have a real affinity for settlements, e.g.. Spotted Dove *Streptopelia chinensis*, House Swift *Apus affinis* and Asian Palm swift *Cypsiurus balasiensis*, and a number of other species also take advantage of vegetation cover around settlements, e.g.. Magpie Robin *Copsychus saularis* and Common Iora.

Selected Species Accounts

A total of 148 species was recorded in the study area and listed in Appendix 1. Accounts are given below of a number of selected species, based on the following criteria:

1. Globally endangered, vulnerable or near threatened status, according to the latest IUCN

criteria (Collar *et al.* 1994). The nomination to near threatened status merely means that the species under consideration did not qualify for endangered or vulnerable (N. Collar, pers. comm.), but monitoring is needed.

2. Faunistic importance, e.g., first records for Kalimantan or the province of South Kalimantan, or not recorded for a long time (see Holmes & Burton 1987).
3. Waterbirds occurring in significant numbers.

All dates refer to 1989 except where otherwise stated.

Darter *Anhinga melanogaster*. Surprisingly scarce in the area, as this species was found local but widespread in small numbers in Kalimantan (Holmes & Burton 1987). One bird was seen on a rivulet near Ambahai (Danau Panggang) on 15 Jan, a pair near Barawarawa on 16 Jan and a single bird in a tree top along the Tapin river on 23 Jan. Considered near threatened by Collar *et al.* (1994).

Little Egret *Egretta garzetta*. A few records in the area; three birds were observed along the Tapin river, of which one was in breeding plumage. A captive bird kept in the village of Sungai Buluh in Jan was said to have been caught as a nestling one year previously, which implies confirmation that the species breeds in South Kalimantan.

Cattle Egret *Bubulcus ibis*. Rather common in small and medium sized groups, nearly in the vicinity of water buffaloes; a large flock of 170+ birds observed on 17 Jan was thought to consist mainly of this species.

Javan Pond Heron *Ardeola speciosa*. Very common in the swamp area, along river banks, in ricefields, large roosts were observed in Danau Bangkau (630+ birds on 12 Jan), Ambahai (400+ birds on 15 Jan) and along the Awang river (1000+ birds on 17 Jan). Over 90 % of pond herons were in non breeding plumage and could not be specifically identified, but all those coming into breeding plumage were identified as this species.

Black crowned Night heron *Nycticorax nycticorax*. No recent records from South Kalimantan (Holmes & Burton 1987) and never heard at dusk or night, but an immature bird was being kept as a pet by villagers in Jan (although its origin was not established). This is somewhat a mystery bird in Kalimantan.

Lesser Adjutant *Leptoptilos javanicus*. In small numbers throughout the open swamp habitat, most often observed while soaring high above the swamps; on 14 Jan a group of 12-20 birds was seen soaring above the edge of Alabio polder; on 17 Jan a total of 56 birds was counted in the surroundings of Danau Panggang, where G. Davison (*in litt.*) saw 28 soaring in thermals in January 1995. Considered vulnerable (Collar *et al.* 1994).

Grey headed Fish eagle *Ichthyophaga ichthyaetus*. Seen almost daily seen in swampy areas, singly or in pairs. Several immature birds were seen Only recent Kalimantan records are from the Barito swamps (Holmes & Burton 1987). Considered near threatened by Collar *et al.* (1994).

Changeable Hawk eagle *Spizaetus cirrhatus*. Mainly single birds were seen daily throughout the swampy area, where forest patches remained. On 19 January 1989 a family group of two adults and one juvenile was observed near the Balangan river. Though considered rare by Smythies (1981), mostly black phase birds were encountered. This is consistent with Coomans de Ruiter (1936) who reports the light phase as rare around Pontianak. Only few recent records of the species from elsewhere in Kalimantan.

[**Peregrine Falcon** *Falco peregrinus*. A falcon, passing swiftly at several hundred meters distance on 15 Jan near Palbatu village, most likely belonged to this species. This would be the second record for Kalimantan (Holmes, in press).]

Wandering Treeduck *Dendrocygna arcuata*. All treeducks kept in cages (Ambahai, Sungai Suluh), and most ducks of which good views were obtained in the field in January 1989, belonged to this species. Treeducks were commonly seen foraging in small to moderate numbers in the swamps and flying in groups; on 15 Jan a flock of *c.* 250 birds was seen near Ambahai and a distant flock of 100" birds was seen on 23 Jan in the late afternoon near Tapin river. In contrast to the information provided by Holmes & Burton (1987), treeducks were far from rare in the swamps and could be seen daily.

Lesser Treeduck *Dendrocygna javanica*. Never identified with certainty, but a total of eight treeducks seen at rest on 12 Jan on Danau Bangkau and two near Mantaas appeared to lack the white plumes typical of the previous species.

Cotton Pygmy Goose *Nettapus coromandelianus*. Observed regularly in Jan in pairs and in small groups in the swamps and along rivulets in disturbed riverine forest. Presumed to be a visitor in South Kalimantan, where small numbers were seen on swamps north of Amuntai in Nov (Holmes & Burton 1989).

Grey Teal *Anas gibberifrons*. On 14 Jan six small ducks were observed landing in the swamps of Danau Panggang; the uniformly light brown head, the dark blue speculum, richly bordered with white, were diagnostic of this species. The first observations of this species in Kalimantan were reported by Eve & Guigues (1989) for the Mahakam river delta.

Garganey *Anas querquedula*. On 12 Jan one Garganey was observed flying together with two

treeducks near the Batangalai river; later on the same day another single bird was seen on nearby Danau Bangkau. On 18 Jan a Garganey with two treeducks was seen along the Awang river. Another small duck along the Awang river on 18 Jan may have been this species. The only recent record is a single bird seen in East Kalimantan (Holmes & Burton 1987) (but see Kalimantan Bird Report, this issue).

Watercock *Gallixes cinerea*. The number of sightings in the area (13, of which ten were along the Awang river) suggests a relative abundance. Smythies (1981) mentions the species as an occasional and sporadic visitor to Borneo; Holmes & Burton (1987) reported two birds captured by locals in December 1978 in the area.

Comb crested Jacana *Irediparra gallinacea*. Locally common throughout the swampy areas where seen almost daily, on 14 Jan a bird with a palish pink comb was seen chasing off another, equally sized jacana, which had a bright coloured comb; nearby in the Alabio polder another "pale comb" was seen with two pulli. Paling of the comb in excited birds has been reported in Australian birds by Pringle (1987). This breeding record in January falls well outside the breeding season reported by Hayman *et al.* (1986), i.e. April–June. In Jan 1995 the species was seen on Danau Panggang by G. Davison (*in/iff.*).

Kentish Plover *Charadrius alexandrinus*. On 23 Jan two plovers of this coastal species were seen in a group of Little Ringed Plover *Charadrius dubius* and sandpipers in somewhat atypical habitat, i.e., on an inland mudbank along the Tapin river. It appears that this is the first inland record of this species in Kalimantan, the only other Kalimantan record being from the Mahakam river delta by Eve & Guigue (1989).

Whiskered Tern *Chlidonias hybridus*. Observed in varying numbers along the rivers in open swamp areas. On 14 Jan a group of 200+ Whiskered and White-winged Terns (see next species) was observed along the river from Danau Bitin to Danau Panggang; the larger part of those identified belonged to the second species (*ca.* 70) and only one Whiskered Tern was seen in full breeding plumage. About 180 terns of both species were seen at the same location on 17 Jan, and 14 Whiskered Terns were seen between Sungai Buluh and Negara on 13 Jan.

White-winged Tern *Chlidonias leucopterus*. See preceding species; apparently the more abundant of the two species at the time of our visit, although Holmes & Burton (1987) did not report any from the same area in November 1978; 23 were seen near Mantaas on 13 January 1989.

Thick-billed Pigeon *Treron curvirostra*. Two birds were observed together on 25 January 1989 in disturbed peat swamp forest south-west of Pulau Pinang. No recent records were available from South Kalimantan (Holmes & Burton 1987).

Cinnamon headed Pigeon *Treron fulvicollis*. Probably rather common in January 1989 throughout the wooded, *Melaleuca* dominated swampy area. The most abundant green pigeon in wooded areas in the Barito region (Holmes & Burton 1987). Considered near threatened by Collar *et al.* (1994).

Red breasted Parakeet *Psittacula alexandri*. First evidence of occurrence was a captive bird as a pet in Margasari, along the Tapin river two birds were seen on 23 Jan. Only known in Borneo from southern Kalimantan, where it may be introduced from Java (Smythies 1981); uncommon in the Barito region (Holmes & Burton 1987).

Long tailed Parakeet *Psittacula longicauda*. Rather common throughout the area, but only observed flying overhead. On 15 Jan a flock of several thousands were seen near Ambahai flying from distant *Melaleuca* and peat swamp forest to roost. Few were seen in Pulau Pinang peat swamp forest, presumably due to severe habitat degradation.

Indian Cuckoo *Cuculus micropterus*. Several males were heard calling on 16 Jan in the *Melaleuca* and peat swamp forest along the Sambujur river; on 18 Jan the species was heard calling from forest along the Awang river. No recent records were available from South Kalimantan (Holmes & Burton 1987).

Violet Cuckoo *Chrysococcyx xanthorhynchus*. Two sight records on 25 and 26 Jan in peat swamp forest west of Pulau Pinang. No recent records for South Kalimantan (Holmes & Burton 1987).

Little Bronze Cuckoo *Chrysococcyx minutillus*. Not uncommon in riverine forest patches and peat swamp forest. A bird was tape recorded on 15 Jan, producing the typical "malayanus" call: a slightly descending "chiwchiwchiw chiw" with a hardly noticeable pause after the third note was heard.

Chestnut bellied Malkoha *Rhopodytes sumatranus*. On 21 Jan one was seen in a bird wave in riverine forest along the Jayau river; on 26 Jan single birds were seen in the logged peat swamp forest south west of Pulau Pinang. No recent records were available for South Kalimantan (Holmes & Burton 1987).

Chestnut breasted Malkoha *Rhamphococcyx curvirostris*. One bird seen in the logged peat swamp forest of Pulau Pinang on 25 Jan. No recent records were available for South Kalimantan (Holmes & Burton 1987).

Large tailed Nightjar *Caprimulgus macrurus*. A nightjar perched on a stake in the Paminggir river after dusk on 15 January 1989 had large white spots on the outer tail feathers and one large white patch on the throat, which are diagnostic characters of this species. No calls typical of this species were heard during the survey. Smythies (1981) reports the species as common in the lowlands of Borneo; but it is

stated as rare in Kalimantan by Holmes & Burton (1987). Mees (1977) reports the absence of any records from the whole of southern and eastern Borneo (read: Kalimantan) (but see Kalimantan Bird Report, this issue).

Savannah Nightjar *Caprimulgus affinis*. Locally abundant along the rivers, especially near Negara, where on 12 Jan aggregations of up to 50 birds, foraging over the swamps, and numerous birds were seen at dusk perched on the roofs of houses.

Black nest Swiftlet *Aerodramus maximus*. Though the identification of swiftlets in the field proved in most cases extremely difficult, if not impossible, we were confident that 25 swiftlets, broad winged and with almost unforked tails, above the logged forest near Pulau Pinang, were of this species. No other records for South Kalimantan (Holmes & Burton 1987).

Blue eared Kingfisher *Alcedo meninting*. Common throughout the area in wooded swamp habitats; on 19 Jan, 24 birds were counted along a 20 km stretch of the Balangan river.

Ruddy Kingfisher *Halcyon coromanda*. A single bird was seen on 23 Jan by CP near our camp site on the Tapin river bank near swampy *Melaleuca* forest. There are only few records for Kalimantan (Holmes & Burton 1987).

Black capped Kingfisher *Halcyon pileata*. One bird was seen on 23 Jan at the edge of some low vegetation along the mudbanks of the Tapin river. No recent records from South Kalimantan and only six recent records from the other provinces in Kalimantan (Holmes & Burton 1987).

Blue tailed Bee eater *Merops philippinus*. Common throughout the area; they were also seen above Danau Panggang in January 1995 (G. Davison *in litt.*). W Giesen (*in litt.*) reported thousands of bee eaters (not specifically identified) seen in one continuous flock at dusk on 8 Aug 1989 just upstream of Buasbuas village on the Negara river, apparently following this river in a northerly direction.

Asian Pied Hornbill *Anthracoceros albirostris*. These were the only hornbills observed in the entire area; one bird seen and several heard in the forest along the Barito river; one captive bird was encountered along the road to Kandangan.

Red crowned Barbet *Megalaima rafflesii*. Several voice records, from the forests along the Tapin river and peat swamp forest of Pulau Pinang. One of the commonest lowland barbets in Kalimantan (Holmes & Burton 1987). Considered globally near threatened (Collar *et al.* 1994).

Red throated Barbet *Megalaima mystacophanos*. Calls were heard and several males seen in the

peat swamp forest of Pulau Pinang on 25 and 26 Jan. Holmes & Burton (1987) comment that the species may be absent from the peat swamp [and sandy terrace] forests in the south of Kalimantan, from where no recent data were available.

Grey and buff Woodpecker *Hemicircus concretus*. A pair was seen in a high tree in the peat swamp forest of Pulau Pinang on 25 Jan; during the courtship display observed, the male bowed deeply forward, while giving the usual "kweeeeet" note, followed immediately by a vigorous forward jump. Another single bird was seen on 21 Jan in riverine forest along the Jayau river. No recent records were reported by Holmes & Burton (1987) for South Kalimantan.

Hooded Pitta *Pitta sordida*. On 18 Jan one bird was seen, and at least three others heard in secondary forest near Batumandi; on 19 Jan at least four were heard in an old rubber estate on the banks of the Balangan river. These are the first recent records for Kalimantan (Holmes & Burton 1987).

[Blue winged Pitta *Pitta moluccensis*. On 19 Jan a single double call, typical of the species, was heard in an old rubber estate near the Balangan river (the same that held the Hooded Pittas). Unfortunately only one call was heard so it was not possible to confirm the record by sound recording. No recent records are known from South Kalimantan (Holmes & Burton 1987) (but see Kalimantan Bird Report, this issue).]

Long tailed Shrike *Lanius schach*. Common throughout open habitats, especially open swamps with shrubs. On 10 Jan an adult shrike was seen feeding a fledgling on waste land in Banjar Baru. Every bird seen in the survey area was of the unnamed resident race (Mees 1966) with black crown and grey nape.

White chested Babbler *Trichastoma rostratum*. Rather common in riverine forest along the tapin river; commonly heard in the peat swamp forest near Pulau Pinang. Considered near threatened by Collar *et al.* (1994).

Clamorous/Oriental Reed warbler *Acrocephalus stentoreus/orientalis*. Clamorous is resident in south Kalimantan, though breeding has not been confirmed yet, whereas Oriental Reed warbler is a passage migrant and winter visitor to Borneo from NE and E Asia (Smythies 1981). Large number of reed warblers was observed in the swamps, and some extra attention was paid to the notoriously difficult identification of these species, with the knowledge that both are known from the area (Smythies 1957, Mees 1971). Differences have been reported on morphological characters, song and behaviour. Those characters noted in the field by us are summarized in the table below. Birds fitting the descriptions of both Clamorous and Oriental were seen daily in about the same numbers. Sound recordings were made of several birds.

The field characters of Clamorous and Oriental Reed warblers (after Hoogerwerf & Siccamo 1938; Legakul & Round 1991; Williamson, 1960) are outlined as follows:

	<u>Clamorous</u>	<u>Oriental</u>
Breast	whitish with no streaks more buffy	greyish streaks whitish, washed tawny buff
Underparts	more rufous brown	warm olive brown
Bill	longer, greyish brown below	shorter, brown above, pinkish
Gape	yellow	pinkish
Song	monotonous	more varied
Behaviour	often feeds in low trees very secretive	exposes itself more

Black naped Monarch *Hypothymis azurea*. Not uncommon in Jan in the peat swamp forest of Pulau Pinang. There had been no recent records from South Kalimantan (Holmes & Burton 1987).

Crimson breasted Flowerpecker *Prionochilus percussus*. A few observations were made of this species in the logged peat swamp forest west of Pulau Pinang on 25-26 Jan. No Yellow rumped Flowerpeckers *P. xanthopygius* were seen, and this species appears to be confined to the interior and the northern half of Borneo (but both species can occur sympatrically, e.g. the Natuna Islands, Oberholser (1932).

Plain Flowerpecker *Dicaeum concolor*. On 26 Jan a young bird, distinguished by its orange bill, was seen being fed by an adult, in disturbed peat swamp forest west of Pulau Pinang. There is only a single recent record from (South) Kalimantan (Holmes & Burton 1987).

Scarlet headed Flowerpecker *Dicaeum trochileum*. This flowerpecker was very commonly observed in various types of open habitat. Two variations on its song were commonly heard: a high pitched "ti ti, ti ti, ti ti" and "ti ti ti ti ti"; the latter is not known from birds on Java. Though every male was scrutinized, no Scarlet backed Flowerpecker *D. cruentatum* was recorded in the area. Hybridization between this species and Scarlet headed has been reported at Banjarmasin (Voous & van Bemmelen 1949), and may be more widespread than the one record suggests.

Purple throated Sunbird *Nectarinia sperata*. Locally common in disturbed forest habitat along the major rivers. The species was not reported by Holmes & Burton (1987) from South Kalimantan.

Scaly breasted Munia *Lonchura punctulata*. This munia was locally common in small numbers in open swamp areas along the Buluh river and at the edge of the swamp forests near Pulau Pinang; it was nearly always associated with Chestnut Munia *Lonchura malacca*. This species was first recorded in Borneo by Harvey & Holmes (1976) in December 1974 at Binuang, and recorded at a number of places since. One bird was seen in January 1995 in cultivation at the south margin of Danau Bangkau (G.

Davison *in litt.*).

DISCUSSION

The survey was relatively brief (fifteen days of fieldwork) but very extensive. The species totals for forest habitats are likely to be incomplete as a result, although the totals for open habitats are probably comprehensive for the time of year. Species not recorded during this survey may occur in other months as a result of migratory or local movements (e.g. in response to changing water levels).

In the entire project area, no peat swamp or riparian forest was found that was not disturbed by selective logging, successive logging and burning. Consequently the communities observed were impoverished due to extensive and severe habitat degradation. Apart from the significant numbers of Lesser Adjutant, no particular species recorded or area visited was considered to be of outstanding interest for conservation. However, if any relatively undisturbed areas of these habitats still remain (perhaps along Sungai Barito and near Sambujur), then it is likely that the avifauna will still contain primary forest species that have disappeared from the areas which were surveyed.

The open swamps appeared to hold relatively complete communities, typical of this part of Kalimantan and which are partly composed of elements of 1) Australasian affinity e.g. *Irediparra gallinacea*, and 2) Javanese origin that must have become isolated after the final rising of the sea level over the Sundanese continental shelf, e.g. Javan pond heron, Wandering Tree duck and Purple Swampphen *Porphyrio porphyrio* (Holmes & Burton 1987). The absence during the present survey of a number of these alien elements which were recorded in the last century (see Smythies 1957, 1981) might represent local extinctions, although possibly those species were already marginal. They are, among others, Dusky Moorhen and Black throated Little Grebe *Tachybaptus novaehollandiae* from the first group and the two cormorants *Phalacrocorax sulcirostris* and *P. niger* and Glossy Ibis *Plegadis falcinellus* from the second group.

Another group of alien species is formed by monsoon savanna species of Javanese origin, which are likewise mainly confined to the south eastern corner of Kalimantan (Holmes & Burton 1987), Red breasted Parakeet, Savanna Nightjar, Scarlet headed Flowerpecker and Scaly breasted Munia are examples of this group, which still occur in the survey area.

There is evidence of considerable hunting pressure on the bird populations of the open swamps. The main species concerned are Common Moorhen *Gallinula chloropus*, White browed Crane *Poliolimnas cinerea*, White breasted Waterhen *Amaurornis phoenicurus* and Wandering Treeduck. It is probable that this pressure in and around the swamps is increasing. Indeed, G. Davison (*in litt.* 1995) reported the village head of Sunga Jarum, beside Danau Bangkau, as saying that there is now (in January 1995) only one third of the number of birds on the lake that there were ten years ago.

Certain species of waterbird are vulnerable by nature of their local distribution and habitat requirements. These are Oriental Darter, Lesser Adjutant and Comb crested Jacana, and the absence of the White shouldered Ibis *Pseudibis davisoni* in the area is a significant result of human pressure. The species was specifically looked for during the survey in all habitats and areas, following reports of sightings of unidentified ibises near Binuang, and elsewhere in the region (Holmes & Burton 1987, Holmes 1991).

RECOMMENDATIONS

It appeared difficult to identify areas of particular importance among the open swamps, because the dry season is a very critical period for waterbirds, whose distribution may change with seasonal changes in the availability of flooded swamps. However, the roosts of pond herons and egrets represent key areas for conservation, considering the general scarcity of herons and egrets in Kalimantan (see Smythies 1981).

In Zieren *et al.* (1990) a number of recommendations are given for the resource utilization and conservation of the Sungai Negara wetlands, Recommendations are made below with special reference to the conservation of the bird fauna.

Protection of areas

Efforts should be made to protect any remaining relatively undisturbed peat swamp forest or riparian forest, because such areas, if they are sufficiently large, may still support their full avian communities. These areas should be included in the PHPA system of protected areas as Wildlife Reserve, and the status of Production Forest should be changed to Protection Forest (Giesen 1990). Of the disturbed riparian forest areas visited, two could be considered for protection in the absence of undisturbed habitat:

1. Riparian forest lying between the Paminggir and Barito rivers. This site has a high canopy and may still retain much of its original avian community, if not too disturbed. It was the only area found to hold Asian Pied Hornbills and Hill Mynas. Proboscis Monkey *Nasalis larvatus* and Long tailed Macaque *Macaco fascicularis* were recorded, but crocodiles *Crocodylus* sp. no longer occur.
2. Riparian forest on the Tapin river, immediately south of its junction with Tabirai river. This site is more extensively damaged, but may still hold crocodiles. It contained Long tailed Macaque and Proboscis Monkey, however its avian community was impoverished.

Within the open swamp areas visited, a number of sites could be considered for some degree of protection consistent with the sustainable use of the wetlands by the local communities, whilst ensuring preservation of the waterbird populations. As the principal threats are reclamation for agriculture, burning of vegetation and hunting/trapping of birds, means of overcoming these threats should be examined. The following sites should be considered for protection:

- 3 Open swamps lying between Danau Panggang and Barito river. This area contained a diversity of

open swamp habitats, has a diverse bird community including large pond heron and egret populations, and scarce species such as Oriental Darter, Lesser Adjutant and Comb crested Jacana. It is also a very large area which borders on to *Melaleuca* forest in the south, riparian forest along Paminggir river and peat swamp forest at Sambujur. It would therefore form a suitable conservation area complementary to any established to protect the adjacent forests.

4. Danau Bangkai and surrounding swamps. This provides a typical example of an open swamp bird community. Of particular interest is the egret and pond heron roost at the south west side of the lake. The emphasis here should be on establishing a non hunting area to protect the waterbirds.

5. Danau Bitin. This lake is of interest mainly for the unusually high number of Lesser Adjutants recorded here. It was not clear from our visit how important the open swamp is for the storks, but the birds should be protected if it is a feeding ground. The forest to the north of the lake should be surveyed to establish whether it is used for nesting.

6. Awang river swamps. This is an enclosed sedge swamp, surrounded by swamp forest on at least three sides. The area held numerous Lesser Adjutants and a roost of over 1,000 pond herons. Other reed bed species such as Yellow Bittern, Black Bittern and passerines were numerous.

Further studies

1. Surveys should be carried out in the dry season to examine changes in the distribution of birds and to identify key conservation areas.

2. Efforts should be made to identify waterbird breeding colonies (especially Lesser Adjutant, egrets and pond herons), with a view to their protection.

3 The level of hunting pressure (*eg* at Negara) should be monitored and any threats to the well being of local waterbird populations identified.

4. The avifauna of any remaining peat swamp forest should be surveyed before it disappears forever. More species of conservation interest may occur, such as the endemic Bornean Wren babbler *Ptilocichla leucogrammica* and Bornean Bristlehead *Pityriasis gymnocephala*, both of which occur in *Shorea albida* peat swamp forest elsewhere in Borneo (Smythies 1981).

CONCLUSION

Conservation priorities should ideally have been established immediately, with

implementation within two years for the mixed peat swamp and heath forest and five years for the riparian forests (Giessen 1990). No action has yet been taken, and a drastic decline in waterbird numbers has been reported for Danau Bangkau in the past ten years. Nevertheless, the swamps must still be considered as some of the richest wetlands of Kalimantan and therefore conservation action at any scale and whatever form is still relevant.

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Address:

c/o BirdLife International Indonesia Programme, P.O. Box 310, Bogor 16003, Indonesia

Appendix 1 Distribution and abundance of birds in major habitat types in the Sungai Negara wetlands Sequence and nomenclature follow Andrew (1992). See key at end of table for explanation of symbols; see text for description of habitats

SPECIES:	HABITAT TYPES:	PF	RF	MC	O1	O2	O3	Ow	PI	RI	Set
Oriental Darter	<i>Anhinga melanogaster</i>	-	U	-	L	-	-	L	-	-	-
Purple Heron	<i>Ardea purpurea</i>	-	U	x	C	C	U	-	-	L	-
Great Egret	<i>Casmerodius albus</i>	-	-	-	Ur	Ur	-	-	-	L	-
Intermediate Egret	<i>Egretta intermedia</i>	-	-	-	Cr	Cr	U	-	-	L	-
Little Egret	<i>Egretta garzetta</i>	-	-	-	L	L	-	-	-	L	-
Cattle Egret	<i>Bubulcus ibis</i>	-	-	-	Cr	Cr	U	-	-	L	-
Javan Pond-heron	<i>Ardeola speciosa</i>	-	C	x	Cr	Cr	C	-	-	C	-
Pond-heron sp	<i>Ardeola sp.</i>	-	x	-	x	x	x	-	-	x	-
Striated Heron	<i>Butorides striatus</i>	-	L	-	-	-	-	-	-	-	-
Yellow Bittern	<i>Ixobrychus sinensis</i>	-	-	U	C	C	C	-	-	L	-
Cinnamon Bittern	<i>Ixobrychus cinnamomeus</i>	-	-	-	U	U	U	-	-	x	-
Black Bittern	<i>Ixobrychus flavicollis</i>	?	-	U	C	C	C	-	-	x	-
Lesser Adjutant	<i>Leptoptilos javanicus</i>	x	C	x	C	C	U	-	-	x	-
Oriental Honey-buzzard	<i>Pernis ptilorhynchus</i>	-	-	-	-	-	-	-	-	U	-
Black-winged Kite	<i>Elanus caeruleus</i>	-	C	x	U	C	U	-	C	C	C
Brahminy Kite	<i>Haliastur indus</i>	-	Cb	x	C	C	C	C	-	U	C
White-bellied Sea-eagle	<i>Haliaeetus leucogaster</i>	-	Lb	-	-	-	-	L	-	-	-
Grey-headed Fish-eagle	<i>Ichthyophaga ichthyaeus</i>	x	Cb	?	-	-	-	-	-	-	-
Crested Serpent-eagle	<i>Spilornis cheela</i>	-	Lb	-	-	-	-	-	-	-	-
Changeable Hawk-eagle	<i>Spizaetus cirrhatus</i>	x	C	x	-	-	-	-	U	L	-
Black-thighed Falconet	<i>Microhierax fingillarius</i>	-	C	-	-	-	-	-	-	-	-
Peregrine Falcon	<i>Falco peregrinus</i>	-	?	-	-	-	-	-	-	-	-
Wandering Whistling-duck	<i>Dendrocygna arcuata</i>	-	-	-	C	C	C	U	-	x	-
Lesser Whistling-duck	<i>Dendrocygna javanica</i>	-	-	-	x	x	x	-	-	-	-
Cotton Pygmy Goose	<i>Nettion coromandelianus</i>	L	U	-	U	U	U	U	-	-	-

SPECIES:	HABITAT TYPES:	PF	RF	MC	O1	O2	O3	OW	PI	Ri	Set
Sunda Teal	<i>Anas gibberifrons</i>	-	-	-	-	-	L	L	-	-	-
Garganey	<i>Anas querquedula</i>	-	-	-	U	U	u	?	-	-	-
White-browed Crane	<i>Ptilinopus cinerea</i>	-	x	x	C	C	-	-	-	x	L
White-breasted Waterhen	<i>Anaouromis phoenicurus</i>	U	U	x	C	C	C	-	L	x	C
Watercock	<i>Gallinix cinerea</i>	-	-	-	L	L	-	-	-	-	-
Common Moorhen	<i>Gallinula chloropus</i>	-	-	-	Cb	Cb	Cb	C	-	x	L
Purple Swamphen	<i>Porphyrio porphyrio</i>	-	-	-	U	U	U	-	-	-	-
Comb-crested Jacana	<i>Irediparra gallinacea</i>	-	-	-	Cb	-	Cb	-	-	-	-
Little Ringed Plover	<i>Charadrius dubius</i>	-	-	-	-	-	-	L	-	-	-
Kentish Plover	<i>Charadrius alexandrinus</i>	-	-	-	-	-	-	L	-	-	-
Greater Sand-plover	<i>Charadrius leschenaultii</i>	-	-	-	-	-	-	?	-	-	-
Wood Sandpiper	<i>Tringa glareola</i>	-	-	-	L	-	-	L	-	-	-
Common Sandpiper	<i>Actitis hypoleucos</i>	-	-	-	U	-	-	C	-	-	L
Swinhoe's Snipe	<i>Gallinago megala</i>	-	-	-	L	-	-	-	-	-	-
Whiskered Tern	<i>Chlidonias hybridus</i>	-	-	-	-	-	C	C	-	-	-
White-winged Tern	<i>Chlidonias leucopterus</i>	-	-	-	-	-	C	C	-	-	L
Thick-billed Green Pigeon	<i>Treron curvirostra</i>	x	-	-	-	-	-	-	-	-	-
Cinnamon-headed Green Pigeon	<i>Treron javicollis</i>	L/C	?	L/C	-	-	-	-	-	-	-
Pink-necked Green Pigeon	<i>Treron vernans</i>	x	C	C	-	L	-	-	x	-	-
Green Imperial Pigeon	<i>Ducula aenea</i>	x	C	x	-	-	-	-	-	-	-
Spotted Dove	<i>Streptopelia chinensis</i>	-	-	x	-	U	-	-	C	C	C
Red-breasted Parakeet	<i>Psittacula alexandrinus</i>	-	L	-	-	-	-	-	-	-	-
Long-tailed Parakeet	<i>Psittacula longicauda</i>	C	U	x	-	-	-	-	-	-	-
Blue-crowned Hanging-parrot	<i>Loriculus galgulus</i>	U	C	C	-	-	-	-	-	-	-
Indian Cuckoo	<i>Cuculus micropterus</i>	x	-	x	-	-	-	-	x	-	-
Banded Bay Cuckoo	<i>Cacomantis sommeratii</i>	x	-	x	-	-	-	-	-	-	-

SPECIES:	HABITAT TYPES:	PF	RF	MC	O1	O2	O3	Ow	PI	Ri	Set
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	C	x	x	-	-	-	-	C	-	L
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	U	U	-	-	-	-	-	-	-	-
Little Bronze Cuckoo	<i>Chrysococcyx minutillus</i>	C	C	-	-	-	-	-	-	-	-
Drongo Cuckoo	<i>Surniculus lugubris</i>	x	C	-	-	-	-	-	-	-	-
Chestnut-bellied Malkoha	<i>Rhopoclytes sumatranus</i>	U	U	-	-	-	-	-	-	-	-
Chestnut-breasted Malkoha	<i>Rhamphococcyx curvirostris</i>	x	-	-	-	-	-	-	-	-	-
Greater Coucal	<i>Centropus sinensis</i>	C	x	C	C	U	-	-	C	x	C
Lesser Coucal	<i>Centropus bengalensis</i>	-	x	x	C	U	-	-	C	x	C
Collared Scopsowl	<i>Otus tempiji</i>	x	-	x	-	-	-	-	-	-	-
Buffy Fish-owl	<i>Ketupa ketupu</i>	-	x	-	-	-	-	x	-	-	-
Brown Boobook	<i>Ninox scutulata</i>	x	-	-	-	-	-	-	-	-	-
Large-tailed Nightjar	<i>Caprimulgus macrurus</i>	-	x	-	-	-	-	-	-	-	-
Savanna Nightjar	<i>Caprimulgus affinis</i>	-	C	C	X	C	x	?	-	-	C
Edible-nest Swiftlet	<i>Aerodramus fuciphagus</i>	-	-	-	-	-	-	-	-	-	x
Black-nest Swiftlet	<i>Aerodramus maximus</i>	x	-	-	-	-	-	-	-	-	L
Brown-backed Needletail	<i>Hirundapus giganteus</i>	?	-	-	-	-	-	-	-	-	-
Little Swift	<i>Apus affinis</i>	-	L	x	L	L	L	L	-	-	C
Asian Palm-swift	<i>Cypsiurus balasienis</i>	-	L	C	L	L	L	L	C	C	C
Grey-rumped Tree-swift	<i>Hemiprocne longipennis</i>	U	U	-	-	-	-	-	-	-	-
Common Kingfisher	<i>Alcedo atthis</i>	-	-	x	-	-	-	-	-	-	-
Blue-eared Kingfisher	<i>Alcedo meninting</i>	C	C	U	-	-	-	-	-	-	-
Oriental Dwarf Kingfisher	<i>Ceyx erithacus</i>	C	-	-	-	-	-	-	-	-	-
Stork-billed Kingfisher	<i>Pelargopsis capensis</i>	x	C	x	L	L	L	-	L	x	L
Ruddy Kingfisher	<i>Halcyon coromanda</i>	-	-	x	-	-	-	-	-	-	-
Black-capped Kingfisher	<i>Halcyon pileata</i>	-	-	x	-	-	-	-	-	-	-
Collared Kingfisher	<i>Halcyon chloris</i>	-	U	x	-	-	-	-	U	-	U

SPECIES:	HABITAT TYPES:	PF	RF	MC	O1	O2	O3	Ow	PI	RI	Set
Crimson-breasted Flowerpecker	<i>Ptilinopus perousus</i>	C	-	-	-	-	-	-	-	-	-
Orange-bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	C	-	x	-	-	-	-	-	-	L
Plain Flowerpecker	<i>Dicaeum concolor</i>	xb	-	-	-	-	-	-	-	-	-
Scarlet-headed Flowerpecker	<i>Dicaeum trochileum</i>	?	C	Cb	-	-	-	-	C	-	C
Brown-throated Sunbird	<i>Anthreptes malacensis</i>	C	C	C	-	-	-	-	C	L	C
Ruby-cheeked Sunbird	<i>Anthreptes singalensis</i>	C	U	x	-	-	-	-	-	-	-
Purple-throated Sunbird	<i>Nectarinia sperata</i>	-	U	-	-	-	-	-	C	-	-
Olive-backed Sunbird	<i>Nectarinia jugularis</i>	-	-	x	-	-	-	-	-	-	C
Crimson Sunbird	<i>Aethopyga siparaja</i>	U	-	-	-	-	-	-	-	-	-
Little Spiderhunter	<i>Arachnothera longirostra</i>	-	-	-	-	-	-	-	-	-	-
Dusky Munia	<i>Lonchura fusca</i>	U	U	U	-	-	-	-	x	-	-
Scaly-breasted Munia	<i>Lonchura punctulata</i>	-	-	-	L	L	-	-	L	L	L
Chestnut Munia	<i>Lonchura malacca</i>	-	-	-	C	C	-	-	-	C	L
Java Sparrow	<i>Padda oryzivora</i>	-	-	-	-	-	-	-	L	-	-
Asian Glossy Starling	<i>Aplonis panayensis</i>	-	U	-	-	-	-	-	C	-	L
Hill Myna	<i>Gracula religiosa</i>	-	L	-	-	-	-	-	-	-	-
Bronzed Drong	<i>Dicrurus aeneus</i>	U	-	-	-	-	-	-	-	-	-
Greater Racquet-tailed Drongo	<i>Dicrurus paradiseus</i>	C	C	-	-	-	-	-	-	-	-
White-breasted Wood-swallow	<i>Artamus leucorhynchus</i>	?	C	x	L	L	L	L	C	C	C

Habitat types:

- PF : Peat swamp forest (heavily logged)
 RF : Riparian forest (heavily logged)
 MC : *Melaleuca / Combretocarpus* swamp forest
 O1 : Open swamp (immersed sedge and grasslands)
 O2 : Open swamp (immersed sedge and grasslands with *Mimosa* shrubs)
 O3 : Open swamp (aquatic vegetation - submerged/floating/*kumpang*)
 Ow : Open water bodies
 Pl : Rubber and fruit plantations (ladang)
 Ri : Ricefields
 Set : Settlements

Abundance status

- C : common
 U : uncommon
 L : local
 ? : identification indeterminate
 b : breeding
 r : roosting
 x : present, no abundance assessment made

The following species, not seen during the present survey, were reported by *Smythies (1957, 1981; in 19th century), D A Holmes (in Scott 1989), W Giesen (in litt 1994) and G Davison (in litt 1994)

- *Little Black Cormorant - *Phalacrocorax sulcirostris*
 *Little Cormorant - *Phalacrocorax niger*
 Striated Heron - *Butorides striatus*
 *Glossy Ibis - *Plegadis falcinellus*
 White-shouldered Ibis - *Pseudibis davisoni*
 Slaty-breasted Rail - *Gallirallus striatus*
 Ruddy-breasted Crane - *Porzana fusca*
 *Dusky Moorhen - *Gallinula tenebrosa*
 Greater Painted Snipe - *Rostratula benghalensis*
 Common Greenshank - *Tringa nebularia*
 Pintail Snipe - *Gallinago stenura*
 Common Snipe - *Gallinago gallinago*
 *White-headed Stilt - *Himantopus himantopus*
 Red Avadavat - *Amandava amandava*