RECENT NOTES ON THE AVIFAUNA OF KALIMANTAN

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INTRODUCTION

In the introduction to his *Annotated checklist of the birds of Borneo,* Smythies (1957) outlines the history of ornithological study on the island. A notable lack of field studies in Kalimantan (Indonesian Borneo) is apparent over the past fifty years. In the previous century, there had been some two dozen individuals collecting or studying, especially in the Banjarmasin area, but faunal studies virtually ceased after the outbreak of the Second World War. Pfeffer (1960-1961) took part in a French expedition to East Kalimantan, and Pearson (1975) published a brief list of birds in the Kutai reserve, the site of a field research station until it was destroyed by fire in 1983. Their data, and some unpublished records of a few others in the 1970's (J. T. Marshall, K. V. Thompson) are incorporated into the third edition of Smythies' *The Birds of Borneo* (1981).

The purpose of the present paper is to publish notes on Kalimantan birds to cover the period from those included in the latest edition of Smythies' work up to the present time, and thus to update the record in expectation of an increase in ornithological activity in the near future. There has been very little further study, and in acknowledgement to Smythies' third edition, the Earl of Cranbook writes:"I regret only that the book still retains such a strongly northern and north-western bias. The four provinces of Kalimantan encompass the greater part of the island of Borneo. Up-to-date ornithological knowledge of this area is sadly deficient, perhaps this edition …...will find its way into Indonesia and stimulate interest and comment". The present paper contributes a little to redress this imbalance.

As was already apparent early in this century, the chances of finding new species in Kalimantan are now probably remote, although wide areas of the submontane interior remain utterly unexplored ornithologically. Furthermore, most Bornean endemics are montane, and although they are well described from the northern portion of Borneo, their distribution through the higher mountain ranges that extend into Kalimantan is imperfectly known. Not one sighting of a montane endemic has been reported in Kalimantan in recent decades.

However the lowlands carry a few endemics and some apparently very rare species, while the south-eastern corner of Kalimantan is especially interesting, with its pleistocene affinities with the fauna of Java. There are also some small but intriguing affinities with Sulawesi. Regional variations and races, sometimes with clearly recognizable differences in song, would provide a fertile field for study.

The senior author (DAH) has made brief visits to each of the four provinces of Kalimantan (West, Central, South and East) in 1974 and 1981-85, while engaged on official duties with the Government of Indonesia as a land use planner. These duties, however, did not permit time to be spent in resolving problems of identification or in the preparation of comprehensive site lists. Sites visited are listed in Appendix 2. Kenneth Burton (KB) was resident in Palangkaraya from July 1984 to May 1986; he also visited the upper Barito in August - September 1986. We also gratefully acknowledge the extensive records that were freely supplied by Tom Gula (TG) who was resident in Banjarmasin from March 1983 to April 1985. Acknowledgement is also due for the incidental site lists provided by

Syarifin Gardiner (SG) and David Wall (JRDW), mostly from Central Kalimantan. The Snowy Mountains Engineering Corporation team on the Pade Hydroelectric Project in the upper Sambas region of Hast Kalimantan have published a bird list (SMEC, 1983) based on specimens brought to the base camp by villagers. These were identified at site using standard reference works or in some cases skins were purchased and identified in the "Australian museum". As the author of the bird list is not stated, it is not possible to give credit to the records, but those of interest are quoted in the text with the appropriate source.

The records of all these observers are incorporated in the species list in Appendix 1. Figure 1 shows the main geographical features of Kaliaantan, and a glossary of locations is given in Appendix 2. Appendix 3 lists the main conservation reserves in Kalimantan.

Our observations are almost totally confined to the lowlands and swamps, with very few coastal visits and none to the mountains. The mountain chains through the northern parts of Kalimantan remain a wide open field for study for those who have the resources to lount the expeditions needed to reach them. The lowland plains range from undulating to hilly and carry the richest forests. However, sandy terraces with acid heath forest surround the plains widely, reaching a width of 100 km in Central Kalimantan. Outside the terraces lie extensive peat swamps that in turn border the tidal flats. At the longitude of Palangkaraya, sands and peat occupy a zone 250 km wide.

There are extensive swamps in Kalimantan. Those inland on the Kapuas River (West Kalimantan) are believed to be very acid, and may lack faunal variety, although this awaits confirmation. Many of the riverine swamps in the south of Central Kalimantan are also acid, though acidity decreases towards the coast. Two small lakes in Tanjong puting reserve have good potential for birds (Galdikas *et al*. 1985), as has a larger unexplored lake by the Seruyan River (Lake Smbuluh or Belajau). The Mahakam lakes of East Kalimantan are historically quite well known, though visits to these in 1984 were disappointing ornithologically. Probably they were still recovering from the very severe drought of 1982-83, at which time most of the surrounding peat swamps were destroyed by fire. The richest swamps appear to be those adjoining the nost densely populated rural area of Kalimantan in the Barito drainage lying north-east of Banjarmasin (these lie across the border of Central and South Kalimantan).

Logging has now extended to most regions of the lowlands and hills and has been intensive locally. Shifting cultivation has destroyed the forest over wide areas, especially in West Kalimantan where huge expanses of the Kapuas basin have been totally deforested, except for remnants on swamps, sandy terraces and bordering mountains. New settlements such as those under the Government's transmigration programme are spreading but so far their impact has been of minor importance compared to that of shifting cultivation. The most important reserves and national parks on the mainland are listed in Appendix 3. The total area established or proposed for conservation is quite extensive, but in practice adequate policing of many of these reserves has not yet been implemented, and in several instances the natural forest cover has been damaged. Nevertheless, with the inclusion of large areas in the mountains and along the coast that have official status as Protection Forest, a reasonable degree of protection is afforded. The greatest threats come from shifting cultivation and the risk of forest fires in logged areas.

Parts of Kutai National Park have been logged, and the park was severely damaged by the forest fires of 1982-83, with almost total destruction in the logged areas. The fire is reputed to have damaged 3.5 million hectares

in East Kalimantan, making it one of the most calamitous environmental tragedies of the century. The extent of damage is variable, being most extreme in logged areas and peat swamps. 800,000 ha of primary unlogged forest were affected but the damage was less severe and eventual full recovery might be expected. A visit to a burnt-out logged area by DAH at Muara Wahau in 1985 was extremely depressing, with frugivorous birds in particular being almost entirely absent,

There are several areas of limestone karst in the eastern half of Kalimantan, with a spectacular concentration in the central eastern area around sangkulirang. Many are difficult to reach and to our knowledge they have never been studied systematically. The Talisayan area on the edge of this region is developed on a limestone platform at only 50 metres AMSL, and a brief visit indicated significant variations in the avifaunal composition, with hill elements predominating.

We cannot hope to produce checklists of the standard of that for Sabah (Gore, 1968), where the records of some dozen observers over several years are given covering an area about one-sixth that of Kalimantan. Instead, the more significant observations are presented below. Appendix 1 lists all the species we have recorded, with province. Dates are not given in the text except where relevant; in many cases they can be derived from author and locality. The majority of our observations are being recorded on the data sheets of the Atlas of Oriental Birds, organized by the Department of Zoology, University of Malaya.

Our discussion shows that the study of birds is once again active in Kalimantan, and it should form a baseline for the more detailed checklists that we hope will be prepared for such reserves as Gunung Palung, Tanjong Puting and elsewhere.

Systematic notes

CORMORANTS AND DARTERS

Anhinga melanogaster is local but widespread in small numbers on lakes and along rivers. It is moderately common in the Mahakam swamps (DAH) and breeds at Tanjong Puting (Galdikas *et al*, 1985). Apart from one unidentified *Phalacrocorax* sp at the bird lake in Tanjong Puting (op. cit), there appear to have been no records of cormorants since *P. niger* and *P. sulcirostris* were obtained in 1851 in the Barito swamps,

FRIGATEBIRDS

Smythies failed to specify any records from Indonesian Borneo. About 25 Fregata ariel were present off the mouth of the Berau River on November 15 and 19, 1985 (DAH).

HERONS, EGRETS and BITTERNS

Ardea purpurea is reported to be one of the six breeding wetland species at Tanjong Puting (Galdikas *et al*, 1985), and occurs in small numbers in the Barito and Mahakam areas and along rivers in Central Kalimantan. Elsewhere it appears to be rare, with one record from the Pwan River. We have no records of *A. cinerea* and only one *A. sumatrana*, three single birds in the Sesayap and Sekatak deltas.

Butorides striatus is common along rivers in all areas. *Ardeola* sp is very common in the Barito swamps, with a roost of up to 500 birds in December

near Binuang nd smaller numbers on the Mahakam lakes in April and July (DAH). Birds in breeding plumage were confirmed as *A. speciosa* by TG in the Barito region in February and August, and it seems likely that there is a breeding colony somewhere in the area.

Egrets are generally not common in Kalimantan. Galdikas *et al* (1985) infer that *Egretta alba* and *E. garzetta* breed at the bird lake in Tanjong Puting but numbers of each species are not given ("the nesting site of one to two thousand birds of at least six species"). We have scattered records of *Bubulcus ibis, E. alba* and *E. garzetta* from the SE quadrant of Kalimantan, including a few birds in breeding plumage: *B. ibis* at Bati-bati in April (KB, TG) and *E. garzetta* near Muara Ancalong in April' (DAH). Most records of DAH concern *E. intermedia*: on April 15 a total of 100 was counted along the Telen River between Muara Ancalong and the confluence with the Mahakam, but only one was seen on the Mahakatt lakes in July. A distant roost of over 1000 egrets near Amuntai in November may have been this species. At present *E. intermedia* is assumed to be a winter visitor, but the possibility exists that there is an undiscovered breeding colony.

There are a few records of mostly white phase *E. sacra* along the NE coast. The presence of a pair of dark phase birds on the Telen River just below Muara Wahau on April 11 is unusual (DAH); the site is 100 km from the coast by direct flight, but 300 km by river. The birds were feeding on a sandbank in the river when first disturbed.

Galdikas *et al.* quote *Nycticorax nycticorax* as one of the six breeding species on the lake in Tanjong Puting, but the species is evidently rare and the only other record we have is of one near Kuala Kurun in October 1985 (KB).

Ixobrychus cinnamomeus is assumed to be resident, though apparently breeding is yet to be confirmed in Borneo, we have records only from the Barito swamps and Pleihari, including the months of April and August. *I. sinensis* occurs in the same region, and the presence of one on the Mahakam lakes on July 17 (DAH) adds support to the possibility that some are resident. In November 1978 DAH recorded a total of nine *Dupetor flavicollis* at different localities in the Barito swamps.

STORKS

Although *Ciconia stormi* may still be widespread, it is evidently a rare bird, with only a few recent records from East and Central Kalimantan. In Central Kalimantan, one was seen on the Seruyan (DAH), and others on the Kapuas, Kahayan and Rungan Rivers (KB). In East Kalimantan, DAH saw six but probably up to 12 birds along the Teien river below Muara Ancalong, an encouraging record only two years after the great fire which devastated the adjacent swamp forests.

Small numbers of *Leptoptilos javanicus* occur widely in open areas of lowland rivers especially near the coast (up to seven along the pawan, and also the Alalak River in the Barito). Galdikas *et al.* state that there may be a breeding colony at a second unvisited bird lake at Tanjong puting.

IBISES

Recent records of *Pseudibis davisoni* on the upper Mahakam in 1973 and upper Barito in 1979 are included in Smythies (1981). DAH has the following records of ibises:

December 9, 1974. Single dark ibis seen in flight in distance over open country near Binuang.
December 15, 1974. Three ibis-like birds flew across the main road between

Banjarmasin and its airport.April 1, 1984. Single ibis flighting at dusk in ladangs by small tributary of Seruyan River at 112°15" E, 2°12' S. The following morning, another or the same bird was soaring above a small open swamp 3 km downstream. July 21, 1984. Three in flight over the Kedangpahu River one km upstream from its confluence with the Mahakam at Muara Pahu.

Not one of these records could be positively confirmed by a detailed description, being either distant, seen in twilight or against the sun from an unstable dug-out canoe, or seen briefly from a moving car or speedboat. Any of these birds might have been *Plegadis falcinellus* though this is less likely, with only one previous record from the Banjarmasin area in 1851.

At present, the distribution, habitat and remaining population of this species are unknown. There are no records from DAH along other rivers traversed by boat, nor from KB and TG in the Palangkaraya and Banjarmasin areas. If the identity of the four birds in 1974 is correct, it suggests that a few may still have been present in the Barito swamps in the last decade. Most recent records, particularly the confirmed records quoted in Smythies (1981), are from sandbanks in the forested upper reaches of the Barito and Mahakam, a very different habitat from that used elsewhere in its range on mainland Asia. Has human disturbance driven this species to a shy and non-viable relict population in the interior? Surveys are required urgently, but outside this core region, we cannot propose any single area in which to conduct them.

DUCKS

Treeducks are surprisingly rare. Small parties of *Dendrocygna javanica* were seen on the middle Mahakam (DAH), but those around Binuang and Amuntai were all *D. arcuata* (DAG, TG). we have no other records. Small numbers of *Nettapus coromandelianus* were seen on swamps north of Amuntai in November (DAH), and the species is presently assumed to be a visitor only.

The only other species recorded is a drake *Anas querquedula* at Muara Wahau on April 3; the river was in spate and the bird was drifting on logs, repeatedly flying upstream to find a new log when it neared the village.

KITES, HAWKS and EAGLES

While *Elanus caeruleus* is apparently rare and of uncertain status in northern Borneo, it is a widespread bird in Kalimantan, with records north to Ketapang in the west and Tanjong Redeb in the east. It is common in the open country of the Barito and Mahakam regions.

A probable adult *Spizaetus alboniger* was seen over the hills south-east of the Riam Kanan reservoir on August 16, 1984 (KB). Although unconfirmed, this species should be looked for; according to Smythies all existing records are from northern Borneo.

Aviceda jerdoni appears to be widely distributed and resident, with records from Manga Merekai, Pawan River, near the Kumai River and Talisayan, in April, October and November (DAH). Usually, birds were seen in pairs.

There are scattered records of *Icthyophaga nana* along inland rivers (Cempaga, Sekonyer, Murung, Kedangpahu and Telen), but the only records of *I. ichthyaetus* are from the Barito swamps.

FALCONS

Microhierax fringillarius is widespread. A pair was seen feeding an immature near Binuang on December 12. Unfortunately it was not possible to confirm the specific identity of one by the Sekatak River in the NE, but the possible occurrence of the endemic *M. latifrons* of Sabah should be looked for (cf *Copsychus malabaricus stricklandi*).

QUAIL, PARTRIDGES and PHEASANTS

Coturnix chinensis is common in grasslands, and appears to be a fast colonizer, being present on a new agricultural settlement, cleared from forest about three years previously, 15 km upstream from long-established settlements at Tanjong Redeb.

The only record of *Rollulus rouloul* is a flock of seven (two males) seen twice at the same location in Tanjong Puting (KB). *Lophura ignita* was seen in the upper Barito (KB); the only other record of firebacks is from a survey team near Sukamandang that reported several sightings; a colour photo of a captive bird revealed the red facial skin of *Lophura erythrophthalma*.

A call heard by DAH on December 1 1961 appears to be the only record of *Polyplectron malacense* in Borneo in recent decades. The call was at once recognized from a tape of the Malayan race held by K. Scriven in Kuala Lumpur, and consisted of a quacking chuckle, emphasized on the first note, the prolonged phrase being repeated four times. The site was in flooded alluvial forest between Sandai and Mangatayap in West Kalimantan. On the following morning there may have been a second bird heard in dryland forest nearby, but the call was not confirmed. Both sites have now been cleared for an agricultural settlement, but it should be noted that they lie only about 20 km from the eastern boundary of Gunung Palung National park.

Argusianus argus is common generally, with voice records from dryland forest in all areas, except heath forest. It appeared to be especially common at Talisayan.

CRAKES and RAILS

Rallus striatus is common in the swampy areas of the Barito, where it was also seen in dry *Imperata cylindrica* grasslands (alang-alang), a habitat where DAH has seen it also in Java and, commonly. South Sumatra.

A tiny, all-dark crake with deep red legs seen in dry grassland near Binuang on December 20 1974 was tentatively identified as *Porzana fusca*, as was a second bird at Amuntai in November 1978 (DAH). *Porzana cinerea* is common in the Barito swamps.

Gallinula chloropus is common in the Barito swamps. It was found to be very common at Rawa Negara in November, but DAH was unable to identify a single *G. tenebrosa* among them. The latter species has not been seen since it was reported breeding at Bangkau Lake in the last century. No moorhens were seen on the Mahakam lakes in July 1984, perhaps as a result of the 1982-83 drought.

Two freshly trapped female *Gallicrex cinerea* were seen near Binuang on December 18 1974 (DAH). *Porphyrio porphyrio* is present in the Barito swamps, with records from Anuntai and Binuang (DAH) and the southern Barito - Kapuas area (TG).

JACANAS

Irediparra gallinacea is a striking bird that was found to be common in November 1978, in open swamp at Alabio Polder, Rawa Negara and near Binuang (DAH). One of the birds at Rawa Negara was an all-white albino. We have no records of *Hydrophasianus chirurgus*, and the statement in Smythies that it is resident would appear to require re-appraisal,

PAINTED SNIPES

A female *Rostratula benghalensis*, with three probable males nearby, on Rawa Negara on November 23 1978 appears to be only the second record for Kalimantan (DAH).

PLOVERS

Two *Charadrius dubius* near Palangkaraya on August 18 1984 is an early record (KB).

CURLEWS, GODWITS, SANDPIPERS AND SNIPE

At present we have no information on the presence of important wader wintering or transit grounds in Kalimantan. The few visits we have made to coastal or deltaic habitats, principally Tarakan, the Berau estuary, Banjarmasin, Takisung and the Katingan estuary, have produced only a handful of records, with the species listed in Appendix 1.

Scattered records of *Tringa nebularia* in the Barito swamps in November December, with up to eight at Pegatan and one at Tarakan in March, appear to be the first documented records from Kalimantan. KB has a record of an unconfirmed *Calidris canutus* seen with *Xenus cinereus* and *Arenaria interpres* at the mouth of the Katingan on March 29 1986.

Departure of *Actitis hypoleucos* from winter quarters was observed at Muara Wahau in April. On April 12, six calling birds flew off west from the river at dusk. On the following evening, six birds flew down river calling, then returned with two more and likewise flew off west into the dusk.

PRATINCOLES

Our only record is of a single *Glareola maldivarum* at Pontianak Airport on August 19 1981. This is only three days later than the earliest recorded date in winter quarters in Malaya (Medway s Wells, 1976).

TERNS

Recent records of Chlidonias hybrida indicate significant migrations. On a visit to the Barito swamps on November 20-24 1978, they were abundant at Amuntai and Alabio Polder, with a few at Rawa Negara and Bangkau lake. About a third were in breeding plumage and readily identified, although the possibility of *C. leucopterus* in winter plumage also being present cannot be ruled out. It is perhaps significant that none had been seen during two weeks along the swamp edges at Binuang in December 1974. At present, status must be considered uncertain, but it is most likely that these would be migrant *javanicus* during the southern winter (see Mees, 1977), and that those seen in November would have been ready to return South.

Other records are of one in breeding plumage with *Sterna albifrons* on the Mahakam on July 21, but none were seen there in April, and KB s TG saw many at Bati-bati on April 7 and several at the mouth of the Sebangau on March 29.

Some 15 - 20 *Sterna hirundo* off the Berau river mouth on November 15 and 19, 1985 (DAH) and one at Bapinang hilir laut on March 30 1986 (KB) appear to be the first documented records for Kalimantan.

There are records of *Sterna sumatrana* from Banjarmasin in June and Sebangau Bay in March (KB) and of at least 15 *Sterna bergii* with the other terns off the Berau in November (DAH).

Sterna albifrons in both breeding and winter plumage was common along the middle Mahakam River, from Tenggarong to Muara pahtf, in mid-July 1984, though none were seen there in April 1985. This appears to be the first documented inland record for the island of Borneo. In early March, birds in winter plumage were common along the lower Sesayap and Sekatak rivers (DAH).

PIGEONS and DOVES

The most abundant green pigeon in wooded areas of the Barito region and southern Central Kalimantan appears to be *Treron fulvicollis,* but we do not have records of this species from either West or East Kalimantan. In contrast. *T. curvirostra* and *T. olax* are widespread in forested areas and *T. vernans* in open country. *T. capellei* was fairly common at Tumbangmarikoi in October and it was also seen at Pendahara in March and on the Jolo River in September (KB).

Geopelia striata appears to be scarce, with records only from Martapura, palangkaraya and Pegatan. While these may all be feral populations (see Smythies, 1981), it seems more likely that this species is indigenous to the SE, along with other Javanese elements in this region.

A flock of four *Macropygia phasianella* was seen over the Kahayan River near Sepangsimin in October and one at Teluk Joloi in September (KB). *Columba livia* is widespread, and feral populations undoubtedly exist.

PARROTS

Psittacula longicauda and *Loriculua galgulus* are widespread and common, but *Psittinus cyanurus* appears to be rather scarce or local. A large roost of parakeets at Sukadana on the west coast is reported to persist and requires further confirmation; another roost is suspected somewhere to the NE of the Sekatak River (DAH). KB reported huge concentrations of *Psittacula longicauda* and *Psittinus cyanurus* along the middle Sebangau River in March.

Psittacula alexandri persists in the Barito region and there seems no reason to believe that it was introduced from Java (see Smythies, 1981). However it is uncommon. One was seen near Binuang in December 1984, with a voice record from the same area in November 1978 (DAH). KB abd TG have records from Kembang Island, Lupak Dalam where it was locally common, and west to pegatan.

CUCKOOS

Cuculus micropterus, Cacomantis merulinus, Chrysococcyx xanthorhynchus and *Surniculus lugubris* are common generally, and *Cacomantis sonneratii* occurs widely but may be rather scarce. All records of *Cuculus micropterua* are from riverine habitats. The only record of *Cacomantis variolosus* is from the upper Barito where KB recorded it as common in riverine forests.

Elsewhere in the lowlands, the lack of records of this species, whose song is well known to DAH, is significant and suggests that it is confined to the hillier terrain of the interior. Hawk-cuckoos with a song that fits precisely the description of *Cuculus vagans* in Medway S Wells (1976) were heard at Talisayan in November and two or three localities at Nangatayap in April and November. The calls were always heard from the upper canopy, in contrast to *C. fugax* which was heard from the middle storey, of pole forest by the Cempaga River in December and at Talisayan in November (DAH).

DAH has more records of bronze cuckoos in the *Chrysococcyx "malayanus"* group from South and East Kalimantan than from anywhere else in the Sunda region, in December 1974 it was common in the savanna lowlands around Binuang in the Barito region, with the clear carrying "kiri kiri kiri kiri" call being heard most days from the canopy of open woodland. Birds flying freely over several hundred metres at tree-top height might be indicative of breeding behaviour.

Elsewhere, the same call was heard from hillside ladangs on the outskirts of Samarinda in July, and from logged hill forest near Tidung Pala on the Sesayap in March, with two birds calling in an adjacent newly-cleared ladang where the calls were interspersed with the high-pitched descending trill. Finally in November, two were heard in dense forest at Talisayan, one giving the same "kiri kiri" call and the other a tinkling "ti ti ti ti ti" slightly down the scale.

It serves no value to speculate on relations between *S. minutillus* and *C. russatus* (see parker, 1981), but the relative abundance of bronze cuckoos in the eastern area of Kalimantan, and range of habitats, appears to be significant and would justify detailed study.

Our observations of maikohas support the comment in Smythies (1981) that *Phaenicophaeus javanicus* is the least common, our only record is of one nest-building near palangkaraya in April 1983 (SG).

The only sight record of *Centropus rectunguis* is from Seigohong on the Rungan River (KB), and there are several voice records from the same region. DAH also has voice records from swampy forest near Mangatayap and Tidung Pala, but absolute familiarity with coucal calls is necessary before voice records of this species can be accepted. *C. sinensis* is common and widespread, and its habitat includes primary forest. *C. bengalensis* is abundant, and is another species with rapid colonizing ability, being present for example in a ladang of some 60 ha near Sukamandang, of not more than three to five years age, and 8 km from the nearest open river bank.

In Brunei in 1968 (Holmes, 969), a call was commonly heard in hilly forest, described by Ibans as "tock-tor", which was the name later given to a specimen of *Carpococcyx radiceus* which they trapped, similar calls were heard in lowland forest near Nangatayap, where there was a brief unconfirmed sighting. The call consists of two loud notes, of dove or barbet quality, the first rising and the second falling.

OWLS

Two *Phodilus badius* were heard calling from one site in forest at Sukamandang in April (DAH). *Otus rufescens* was heard calling in the upper Barito region (KB) but not elsewhere in the lowlands.

FROGMOUTHS

A frogmouth seen in secondary growth in grassland beside the swamps at Binuang in December was identified as either *Batrachostomus javensis* or *B. cornutus* (DAH). Frogmouth whistles were heard at two sites near Sukamandang in January and April, the first in a mature riverside village

with fruit trees, the second in riverine forest, and one was heard in March in riverine forest at sekatak. The identity of the whistled calls is unestablished but is believed to be *javensis;* they were clear, descending plaintive or mournful whistles, wavering slightly at the bottom of the scale. The calls at Sekatak were each of about one second duration, repeated at frequent intervals.

NIGHTJARS

Eurostopodus temminckii was heard in *moat* forested 'areas inland except Talisayan (DAH). KB did not encounter this species in the sand and peat forests of Central Kalimantan, although J.T. Marshall (pers .cooun.) has records from Tanjung Puting.

Mees (1977) discounted all the earlier Kalimantan records of *Caprimulgus macrurus* except those from the north-western half of West Kalimantan, and the only recent records are of one calling at Hasau on the Barito in Central Kalimantan on August 1, 1979 (quoted in Symthies, 1981, and confirmed by J.T. Marshall), and up to four birds calling on three consecutive nights in October 1985 at Mandoaai (KB). Nightjars seen by KB at Palangkaraya and by KB and TB at the Riam Kanan reservoir were tentatively identified as this species.

The distribution of *C. macrurus* in Borneo remains something of an enigma. The statement by Smythies (op.cit.) that it is "a common resident throughout the lowlands of Borneo in open country" is clearly incorrect. It is common in open country in Brunei (DAH, pers. obs.) and presumably through Sarawak and Sabah. However, although Gore (1968) also described its status in Sabah as a common reaident, it is significant that Thompson (1966) noted is as "an abundant bird on the Jesselton - Tuaran road but was not seen at any of the other collecting stations in North Borneo". Although it is common locally in west Malaysia and Java, DAH has found it scarce in Sumatra and does not have a single record from Kalimantan.

Despite recent records from Sabah (see Smythies, 1981), there is no evidence that *Caprimulgus affinis* is spreading its range in Kalimantan outside the Banjarmasin region. Our only record is from pegatan (KB), and its present distribution requires investigation.

J.T. Marshall (pers. comm.) states that the record of *Caprimulgus concretus* attributed to him from the upper Barito region and quoted in Smythies (1981) is merely a guess at a distant caller at dusk. Because the voice of this species is still completely unknown, any such guess has no validity and must be deleted from the record. The only record we have is of one specimen from the upper Sambas in West Kalimantan (SMEC, 1983).

SWIFTS

Apus affinis is common in towns and villages including inland villages such as Nanga Merekai, Rantau Pulut and Muara Wahau. It is abundant in Pontianak, palangkaraya and Banjarmasin. Two *Apus pacificus* were seen over Rawa Negara on November 23, 1978 (DAH) and up to 50 near the Katingan mouth on March 29-30 and several at Teluk Jolo on September 8,1986 (KB).

Among the swiftlets, only *Collocalia eaculenta* was identified widely. KB has records of *Collocalia maxima* at a number of sites in central Kalimantan, suggesting that it may range widely away from limestone caves.

TREE SWIFTS

Over 200 *Hemiprocne longipennis* gathered on dead trees at Talisayan in November following a storm in the afternoon. They dispersed later in the afternoon, not remaining to roost, and no such gatherings were seen on subsequent days.

TROGONS

Calls of *Harpactes kasumba*, *H. diardii* and *H. duvaucelii* were heard in forests in all areas except Talisayan, where it may be significant that only *H. duvaucelii* was heard. SMEC (1983) report *H.oreakios* from the upper Sambas.

KINGFISHERS

The calls of *Lacedo pulchella* heard at Nangatayap, Sukamandang and the Cempaga River (DAH) appeared to be delivered at higher speed than those heard in the Malay Peninsula and Sumatra, but this impression requires controlling by recordings. One or possibly two *Halcyon sancta* were seen feeding in cleared flooded peatswamp near Palangkaraya on May 16, 1985, and another perched along the tidal reaches of the Sekonyer River on June 15, 1985 (KB).

There are three records of *Halcyon coromanda*, one crossing the Barito near Banjarmasin (DAH), one crossing the Kapuas near Basungkai (KB), and a captive bird for sale in Mandomai (KB). DAH also has voice records from mangroves above Kumai, on the Cempaga River, and a distant bird heard in the mangroves from Tarakan Airport. SMEC (1983) report one specimen of *H.concreta* from the upper Sambas.

Halcyon pileata is seemingly a scarce winter visitor with only six widely scattered recent records, all between October 17 and March 8. The scarcity is unexpected in view of the abundance implied by Smythies (1981) at least in northern Borneo.

All recent records of *Alcedo atthis* are between September 3 and March 5 and presumably involve winter visitors. *A. euryzona* was seen only in the upper Barito (KB).

On April 10 a pair of *Ceyx rufidorsus* had dug a nest-hole in the sides of a soil inspection pit, in sandy soils in poor quality dryland forest near Sukamandang. The pit had been dug a month or two previously and was one metre deep. The hole was bored at 30 cm depth into the vertical side of the pit.

Pelargopsis capensis is widespread and common, extending even up small inland tributaries. In July, 29 birds were counted along 33 km of the Kedangpahu River between peninggir and Muara pahu.

BEE-EATERS

A small roost of up to 50 *Merops viridis* was located near Sukamandang in January. The status of *Merops philippinus* in Smythies (1981) is not clear, but all records are indicative of winter or passage visitors. For example, KB has only a single record, from the upper tidal reaches of the Sebangau in March, where it was abundant.

HORNBILLS

The commonest, lowland species appear to be *Anthracoceros malayanus, A. convexus* and *Buceros rhinoceros,* with several records each of *Rhyticeros corrugatus* and *R. undnlatus* and small parties of *Anorrhinus galeritus*. KB reports that *R. undolatua* is the most common hornbill of the peat swamps around Palangkaraya. *Rhinoplax vigil* was heard in hills near Nangatayap and Sesasayap and in the upper Barito, and this species with *A.galeritus* were those most in evidence on the limestone plain of Talisayan.

We have no records of *Berenicornis coiatus,* a bird not known to either author, although J. Mckinnon (pers. coir.) Reports it from Gunung Palung.

BARBETS

Magalaima rafflesii and *M. australis* are the commonest lowland species generally. *M. mystacophanos* and *M. henricii* are widespread but less comaon, and may be absent from the peatswamp and sandy terrace forests of the south.

M. chrysopogon was heard in hilly areas but only once in the lowlands (at Sukamandang), in contrast to Sumatra where it occurs widely in the lowlands. However, the two comoon species on the limestone plain of Talisayan are this species and *M. mystacophanos,* with only a few *M. australis* and no other *Megalaima* barbets.

Calorhamphus fuliginosus is widespread and common.

HONEYGUIDES

There is one record of *Indicator archipelagicus,* a bird that called several tires on disturbance at midday by survey party on a low hillock in alluvial forest at Nangatayap (DM). This forest has now been cleared for an agricultural settlement, but the area is close to the Gunung Palung National Park. SMEC (1983) also report one specimen from West Kalimantan, in the upper Sambas.

WOODPECKERS

Sasia abnormis was mist-netted by TG and KB in flooded riverine scrub near Tanjong Putting, and singles were seen in dead brush in the upper Barito (KB).

Picoides canicapillus and *P. moluccensis* are sympatric in the Banjarmasin - Palangkaraya region (KB, TG), although habitats probably do not overlap. *P. moluccensis* appears to occur mainly in open habitats towards the coast, while *Canicapillus* was seen only in forest clearings inland and along the Murung River in the upper Barito.

Hulleripicus pulverulentus is widespread in the lowlands of Kalimantan and can be heard on most days inland, in striking contrast to its apparent absence in Sumatra.

BROADBILLS

Eurylaimus ochromalus is the most widely heard broadbill in lowland forest, while *E. javanicus* appears to be slightly less common. The latter species was sometimes heard in heath forest where the former was absent.

Cymbirhynchus macrorhynchus is widespread along riverine forests where it appears to be more common than it is in lowland Sumatra. Both *Calyptomena viridis* and *Corydon sumatranus* are widespread though probably less common; on November 18 a pair of the latter species was observed building a nest at Talisayan, in full view of a logging track. The nest was a bulky affair, hanging in the open on long creepers suspended from a middle-storey branch.

PITTAS

Birds of *Pitta moluccensis* type where heard in riverside forest near Sambas in March, and one in November called from a forested limestone slope at Talisayan in the afternoon gloom following a storm. Probable *P. granatina* were heard in lowland and alluvial forest at Sambas and Nangatayap. We have no information on either of the endemic species *P. arcuata* and *P. baudi* perhaps due to lack of familiarity with their calls.

LARKS

The only records we have of *Mirafra javanica* are of songs heard over Banjarmasin Airport in January and April (DAH) and at nearby Banjar Baru (SG). possibly this species has been overlooked, but nevertheless it does not appear to be common in the SE region. In 1976 W.G.Harvey (in Harveys Holmes, 1976) recorded it at Pontianak Airport, suggesting a substantial extension of range, but this record has not been subsequently controlled. None could be heard at dawn there in 1981.

SWALLOWS

The resident and widespread *Hirundo tahitica* is greatly outnumbered by migrant *H. rustica* in winter, urban roosts of which number several thousand birds in Pontianak, Sampit and Banjarmasin, and many hundreds in Sintang, Singkawang and palangkaraya. Large numbers arrived at Pontianak in mid-August 1981.

A single Sand Martin *Riparia riparia* was seen perched with other swallows on September 26 1984 in open tidal swamp along the Kapuas near Mantangai (KB). Good comparative views were obtained, and the record is the first for Kalimantan.

CUCKOO - SHRIKES, TRILLERS and MINIVETS

There are recent records of *Coracina fimbriata* at several localities in South and Central Kalimantan, and KB has recorded *C. striata* from Tanjong Puting.

Lalage nigra is common in the open country of the Barito region, with other records from Nangatayap, Ketapang, Talisayan, Basarang, Lupak dalam and Pegatan.

Pericrocotus igneus and *P. flammeus* have general distribution through the lowlands, although records are rather scarce. However the relationships of these two species in the open country of the Barito region require close study. Minivets of the *Igneus* type were seen commonly in the open savanna around Binuang in December 1974, with a juvenile being fed on December 19 (DAH). However the possibility exists that *P. cinnamomeus* has been overlooked, as it was not known at the time that one specimen of this exists at the British Museum, apparently from this region (Smythies, 1957).

The habitat is atypical for *igneus* and much more similar to that of *cinnamomeus* in Java. However habitat might not be very significant, as unexpectedly a party of six *P. flammeus* was seen once in patchy scrub in open savanna at Binuang.

BULBULS

The species listed in Appendix 1 have general occurrence in appropriate habitats, although *Pycnonotus melanoleucos, P. cyaniventris, Criniger bres.C. finschii* and *Setornis criniger* were recorded only in the upper Barito (KB). SMEC (1983) also reported *P.melanoleucos* and *p.cyaniventris* in the upper Sambas. Small parties of *P. aurigaster* at Palangkaraya in October 1984 and subsequently are presumbly feral.

JAYS MAGPIES AND CROWS

Corvus enca occurs widely in the forests. Smythies (1981) describes *C. macrorhynchos* as a mystery bird in Borneo. It might have been expected to occur commonly in the Barito region but we have no records and indeed saw no crows in open country. This species should be looked for.

Platylophus galericulatus was seen at Nangatayap, the upper Barito and Talisayan, and *Platysmurus leucopterus* at Sukamandang and Sesayap.

A careful search should be made in the SE for *Crypsirina temia*. Mees (1966) shows that specimens in Leiden Museum were probably collected in this region, and in view of the other Javanese elements present, further evidence of this species is now required.

TITS

The first record of a Great Tit *Parus major* in Kalimantan was made by DAH, who heard one calling briefly from mid-stream, during a speedboat breakdown, in the undisturbed mangroves that line the Kumai River above Kumai town on January 27 1983. The single voice record, so far from previously known range, would not have been accepted if the species had not later been confirmed in the Banjarmasin region.

On June 27 1983, TG saw a party of three foraging in low trees near houses in the town of Lupak Dalam, beside the Kapuas River about 10 km free the coast. Later on the same day he observed a single bird feeding low in coconut palms in a rice field nearby.

On January 19 1984 near Sungai Pinang, about 25 km NE of Banjarmasin, TG saw a single bird low in coconuts in a rice/coconut plantation. Finally on August 17 1984, TG and KB saw a pair on the edge of mangroves on Pulau Keobang, a small island in the Barito River opposite Banjarmasin.

These records indicate a substantial extension of the species' known range, and it can no longer be considered Smythies' "mystery bird of Borneo". The mangrove and coastal habitat suggests that this is part of the typical range of this species in Borneo, and it is not a remnant of the open country fauna of Javanese elements. It will be interesting to observe whether Great Tits gain a foothold in the varied habitat now being formed on the island, and they should be looked for anywhere around the coast.

BABBLERS

The babblers listed in Appendix 1 are mostly widespread and common in the appropriate habitats. There was one sight record of *Pomatorhinus montanus* in song in lowland forest near the Cempaga River, and a voice record near Sesayap. In both cases, the song was the triple hoot that is characteristic of this rather secretive and solitary bird of lowland Sundanese forests, quite unlike the noisy, varied calls of the active parties that are found in montane Java and probably also Sumatra. These differences in character and voice nay indicate the need for taxonomic review.

There was one record of *Napothera atrigularis* from a riverside thicket at Nangatayap. On the basis of song it would appear that this form is very similar to *N. macrodactyla.*

Stachyris rufifrons was heard commonly on a 500 metre hill near Sesayap. It was also identified from tape recordings made by K.B. in the Upper Barito region. Similarly, there are only two records of *S. poliocephala,* in bamboo thickets and rubber plantations below 1000 m in the Meratus Range near Loksado (KB), and two of *S. leucotis*. Wells (1985) notes that the latter species in Sarawak is a slope specialist, in contrast to its habitat in the Malay Peninsula and Sumatra; one record was in foothills at Nangatayap and the second on a short bluff in the lowland limestone plateau of Talisayan, an area noted earlier as having predominantly hill elements.

Finally, once the call of *Eupetea macrocercus* is known and safely distinguishable from that of *Pitta granatina,* it is found to occur widely. Voice records were obtained from Peninggir, Sesayap, and probably Nangatayap, and several from Sukamandang where the species was confirmed by sightings, while at Talisayan up to six birds were heard calling along 1600 metres of track.

THRUSHES

A white-rumped Shamma beside the S. Sekatak near Talisayan had the white cap of the Sabah race *Copsychus malabaricus stricklandi,* considered a full species by some authorities. This is the first record of this distinctive race from Kalimantan, extending its known range southwards by about 100 km. The southern limit needs to be established, and the possible occurrence of intergrades, perhaps in the region of Tanjung Selor; a bird seen at Talisayan had the concolorous blue-black crown of the typical race. Smythies (1981) notes that the ranges of the two races overlap, but Gore (1968) did not differentiate between them.

Copsychus pyrropygus was heard and confirmed commonly at S. Cempaga and Sukamandang, and one was heard unexpectedly in the burnt alluvial forest at Muara Wahau. The typical habitat at the first two locations was rather inferior forest, though not heath forest. Although immediately recognizable, it was noted that the song varied from those heard in Sumatra by the single prolonged whistled tending to be broken into two to four separate notes.

There were several records of *Enicurus leschenaulti* from Nangatayap, one from Sukamandang, (DAH), and one from the upper Barito (KB). Most records were from wet or slightly swampy forest, not always associated with running water, a habitat that is typical of this species in the lowlands. *E. ruficapillus* was recorded twice in the upper Barito along small clear streams (KB).

WARBLER

Most records of *Acrocephalus* sp are, perhaps incidentally, from the winter period November to April, and resident *A. stentoreus* was not differentiated from migrant forms. Records are from the Barito swamp area, Nangatayap and Muara Kaman. Full song presumably of *A. stentoreus* was heard in November at Alabio Polder, where it was very conmon, and at Muara Kaman on April 10.

Songs of *Locustella* sp were heard in the Binuang area in November (1974 and 1978), but the one good sighting was inconclusive, *L. certhiola* or *L. lanceolata* .

KB has records of *Phylloscopus borealis* from riverine forest at Bukitsua and Pendahara in March and Tumbangmarikoi in October.

There is one record of *Abroscopus superciliaris* in a bamboo clump on a steep riverbank along the Marikoi River near Turabangmarikoi (KB).

We have no further records of *Cisticola exilis* since the first recorded by W.G. Harvey at Pontianak in 1976 (Harvey & Holmes, 1976).

FLYCATCHERS

Rhinomyias umbratilis was recorded only at Marang in peat swamp forest (KB). *Cyornis rufigastra* was seen in scrub at the swamp edge at Binuang (DAH) and in mangroves on Pulau Kembang (KB, TG), while *C. turcosa* was observed at several locations at Nangatayap, the cempaga River, Seigohong, Tanjong Puting and the upper Barito.

A record of *Ficedula dumetoria* by KB at Tanjung Puting on 2 February 1985 seems unlikely on this flat coastal plain, but the species has subsequently been onfirmed in the hand at the same locality by A.D. & S.V. Nash (pers.comm).

Philentoma pyrhopterum was observed at Nangatayap and Sekatak, but this species is easily overlooked unless the observer is already familiar with it.*P. velatum* was recorded only at Talisayan (DAH) and in the upper Kahayan region (SG).

WHISTLERS

Pachycephala cinerea is not confined to coastal districts as given in Smythies (1981) as it occurs well inland in areas of inferior forest on sandy terraces, and it was heard commonly at Tanah Merah near Nangatayap and at Sukaraandang.

WOOD-SHRIKE

We have three records of the Bald-headed Wood-Shrike or Bornean Bristlehead *Pityriasis gymnocephala.* This unusual endemic may be quite widely distributed in a variety of lowland forest habitats, but records appear to be rather incidental. When present, it is quite tame and obtrusive, and the variety of chortling calls are sufficiently distinctive to attract attention. DAH saw a loose party of 8 birds in the middle storey alongside a logging track near Sukamandang on April 10 1984, and KB saw 4 or 5 in similar habitat in September 1985 near Palangkaraya, and in lightly logged forest near Muara Joloi in September 1986.

SHRIKES

Both *Lanius tigrinus* and *L. cristatus* were recorded widely in winter. However *L. schach* which appears to be only a vagrant in northern Borneo is now confirmed to be an abundant resident in the open country of the south, with records west to the top of the Kumai River and north to the Samarinda region. These birds fit the description of the un-named race recognized by Mees (1966), with black crown and grey nape. A bird seen from a speedboat between Muara Ancalong and Muara Hainan on April 15 1985 may have had the all-black crown and hindneck of the Philippine race *nasutus,* but was not confirmed.

STARLINGS and MYNAS

Our observations confirm *Aplonis panayensis* as a predominantly coastal species, with large numbers of roosting birds for example at Talisayan and Mandomai. It ranges inland at least to Nangatayap, Palangkaraya and Muara Ancalong,

Single *Acridotheres* sp near Banjarmasin Airport in November 1978 and February 1983 (DAH), A. tristis at Hanjalipan in September 1981 (JRDW) and a *Sturnus contra* at Palangkaraya in August 1984 (KB) are all assumed to be escaped birds.

Flocks of between 6 and 10 starlings were seen on several occasions between December 14 and 18 1974 in the Binuang area, usually flying south or east in direct flight at moderate elevation. Confirmation could not be obtained but the description of pale head and bodies, white rump, and confirmed black upper wings with white bars in some birds, tallies well with *Sturnus philippensis,* the species most likely to be encountered in eastern Borneo although not yet recorded from Kalimantan. On March 7 1985, up to 50 starlings seen in early morning silhouette from a speedboat between Tidung Paia and Sesayap may have been the same species.

SUNBIRDS and SPIDERHUNTERS

Anthreptes malacensis and *Nectarinia jugularis* are the commonest opencountry species of the lowlands. *A.singalensis* is common in the forests of the south (KB). Most records of *N. calcostetha* are from coconut palms and sometimes gardens and other cultivation, with few records from mangroves (KB). *Aethopyga siparaja* was recorded at numerous localities in the south (KB,TG), and in the upper Sambas (SMEC, 1983).

FLOWERPECKERS

Dicaeum trochileum was seen only in the Barito area where it is not uncommon, with records from Alabio, Barambai (DAH), Riam Kanan reservoir and Mandomai (KB,TG). The limits of its range need to be established, as well as its relationship with *P. cruentatum,* in view of the probable hybrid specimen from Samarinda in the Zoological Museum, Bogor. KB has a record of *D. concolor* from the foothills at Loksado.

Prionochilus percussus occurs widely in the southern lowlands, where there were no records of the endemic *P. xanthopygius,* possibly indicating a degree of allopatry. However KB recorded the two species both occurring in the upper Barito in September 1986, and the relationships of these should also be studied. The only other record we have is of three specimens of *P. xanthopygius,* and none of *P. percussus,* in the upper Sambas (SMEC, 1983).

WHITE-EYES

Zosterops flava, which is known in Borneo from four specimens in the south and one from Kuching, was seen in and around Lupak Dalam in June 1983, in low waterside trees in the town fid Met coconut groves nearby (TG), and coun only in mangroves and gardens around Banjarmasin in December 1985 and Pegatan in March 1986 (KB).

SPARROWS and MUNIAS

The only records we have of *Passer montanus* are fromTanjong Redeb Airport, Samarinda and Balikpapan. While Western observers over familiar with sparrows in their home countries Bight easily overlook this species in urban environments, it is nevertheless apparent that it has not yet become widely established in Kalimantan. Sparrows should be looked for in urban environments elsewhere in the region.

The feral *Padda oryzivora* has only a very local distribution, with records confined to the south (Amuntai, Binuang and Lupak Dalam), and there are no reports of large flocks as quoted in Smythies (1981) for the last century.

The common widespread munia of inland clearings is the endemic *Lonchura fuscans. L. malacca* seems to be co on locally only in well established agricultural areas, with a few records of *L. leueogastra.*

Small parties of *Lonchura punctulata* were seen by TG at Binuang, Martapura and Sungai Pinang, following the first record of this species in Borneo at Binuang by DAH in December 1974 (Harvey C Holmes,1976).

Conclusion

This paper summarizes the recent avifaunistic observations from lowland Kalimantan, high-lighting features of distribution and some apparent anomalies, giving details on some species for which little information was previously available, and indicating some taxonomic problems. In conclusion, we present some fields of survey and research for future study.

1. Faunal surveys.

Faunal surveys are required throughout Kalimantan. Obviously any surveys of the mountainous interior, and of the reserves listed in Appendix 3, would be very valuable. However, possibly the greatest urgency lies in surveys of lowland areas under threat, particularly from pressures of logging, shifting cultivation and new agricultural settlement. Such surveys would complement the studies for the Atlas of Oriental Birds, and assist in establishing priorities for conservation. One of the main objectives of *Kukila* is the publication of site lists.

2. Endemics

Depending on taxonomic definition, there are up to 32 endemic species on the island of Borneo (K.D.Bishop, in litt), but the majority are montane. Less than half of these species have been recorded from Kalimantan, it is several decades since scientific expeditions have reached the higher montane regions of Kalimantan, which must form one of the most fertile potential study areas in the Sundanese islands of Indonesia. In addition to the endemics, there are many species that are either rare or very poorly known. In the lowlands, we look forward to further information on such species as *Polyplectron malacense, Carpococcyx radiceus, Caprimulgus concretus, Batrachostonus* spp. *Pitta* spp, *Pycnonotus nieuwenhuisi, Trichastoma perspicillatum, Ptilocichla leucogrammica, Cyornis superba, Pityriasis gymnocephala* and *Prionochilus xanthopygius.*

3. Endangered large waders :

Species such as *Pseudibis papillosa, Ciconia stormi* and *Ardea sumatrana* require study. The White-shouldered Ibis is perhaps the most endangered species on the island of Borneo, yet very little is known even of its habitat requirements. The usual habitat appears to be inland rivers of the forested lowlands, but there is the possibility that this is an atypical habitat of a relict population.

4. Alien elements.

The south-eastern corner of Kalimantan has two elements of Australasian affinity unknown elsewhere in the Sundanese region: *Gallinula tenebrosa* and *Irediparra gallinacea*. The latter is still common locally but the former has not been seen since it was recorded breeding on Bangkau Lake a hundred years ago. The origin of these two species in Kalimantan is not readily explained, although it may be related to the complex evolutionary history of the island of Sulawesi during the Tertiary area.

More readily explained are the large number of species of presumed Javanese origin that must have become isolated in the region after the final Pleistocene lowering of sea level over the Sundanese continental shelf. They are nearly all wetland or monsoon savanna forms that are adapted to survive in this corner of the island, some of those recorded only in the last century may have been migrant or vagrant individuals (species such as *Phalacrocorax sulcirostris, P. niger, Plegadis falcinellus, Falco moluccensis* and *Himantopus himantopus*). Others are presumed resident but their ranges are poorly known, eg *Ardeola speciosa, Dendrocygna arcuata, Porzana pusilla, P.fusca, Porphyrio porphyrio, Rostratula benghalensis, Psittacula alexandri, Caprimulgus affinis, Dicaeum trochileum, Zosterops flava* and *Lonchura punctulata*. The following species may be awaiting rediscovery: *Podiceps* sp, *Streptopelia bitorquata, Pericrocotus cinnamomeus, Saxicola caprata* and *Crypsirina temia*.

5. Wetlands

Our own experience shows that the wetlands of the Barito drainage in the south may be one of the richest wet areas of the Sundanese region, and almost certainly the richest in Borneo. However, they lie close to the most densely populated rural area in Kalimantan, if not the whole island. Convervation priorities must be established here immediately. The Mahakam swamps in the east have been recorded historically as being rich, though no such impression was obtained on a brief visit by DAH in 1984/1985. This may have been an effect of the 1982/1983 drought, when it was reported that the lakes dried out completely, and the surrounding peat swamps were very severely damaged by fire. The remaining wetlands, and this is believed to include most of the lake region of the Kapuas basin in West Kalimantan, are mostly acid and may be faunistically poor. Little is known of the wetlands nearer the coasts, but KB notes that the Sebangau River in the south is acid and carries very little sediment. An inventory of the wetlands of Indonesia is currently in progress, but in Kalimantan this may serve only to illustrate the inadequacy of our knowledge.

6. Wader grounds

Our own experience has not identified any important wader feeding or resting sites, though we have little experience of the coasts. We have the impression that important wader grounds may not exist, but the current Interwader programme should perhaps look at both the SW and SE corners of the island, and the deltas of the major rivers draining the mountainous interior.

7. Limestone

We are not aware of any surveys that have been made of Irestone karst in Kalimantan. Karst blocks occur locally in Central and South Kalimantan but the main concentration lies in the Sangkuiirang area of the East. It is reported that edible-nest swiftlets breed and are harvested in a cave here, but we have not been able to ascertain the location. The brief visit to a level coastal limestone plain at Taliaayan by DAH indicated a number of variations from the normal lowland avifauna which require study, with a view to recommending representative areas for conservation. The karst cliffs may not be seriously threatened at the present *time* but the lowlands are at risk.

Ringkasan

Jenis-jenis burung yang diuraikan dan diterangkan statusnya, merupakan hasil pengamatan: (a) DAH pada beberapa kali kunjungan singkatnya ke-4 propinsi di Kalimantan (Barat, Tengah, Selatan, dan Timur) pada tahun 1974 dan antara tahun 1981 - 1984;(b) KB sewaktu menetap di palangkaraya antara tahun 1984 - 1986, dan kunjungannya ke hulu Barito pada tahun 1986; (c) TG sewaktu menetap di Banjarurin antara tahun 1983 - 1985; serta (d) SG dan JRDW di Kalteng. Pengamatan ini terutama dilakukan di daerah dataran rendah, daerah rawa, dan di beberapa tempat di tepi pantai; pengamatan tidak dilakukan di daerah pegunungan. Hasil pengamatan ini merupakan data mutakhir mengenai keadaan burung di dataran rendah Kalimantan, setelah diterbitkannya buku The *Birds of Borneo* edisi ke-3 karangan Smythies pada tahun 1981. pengamatan selanjutnya sangat diperlukan.

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APPENDIX 1

Species recorded in Kalimantan by the authors. Those marked * are discussed in the text.
province is indicated by a suffix: West, Central, South and East.

Anhinga melanogaster*	Oriental Darter	WCSE
Fregata ariel*	Lesser Frigatebird	E
Ardea sumatrana*	Great-billed Heron	E
Ardea purpurea*	Purple Heron	WCSE
Butorides striatus*	Little Heron	WCSE
Ardeola speciosa*	Javan Pond-Heron	S
Bubulcus ibis*	Cattle Egret	SE

Egretta sacra*	Pacific Reef-Egret	E
Egretta alba*	Great Egret	CS
Egretta intermedia*	Plumed Egret	CSE
Egretta garzetta*	Little Egret	SB
Nycticorax nycticorax*	Black-crowned Night-Heron	C
Ixobrychus sinensis*	Yellow Bittern	CSE
Ixobrychus cinnamomeus*	Cinnamon Bittern	S
Dupetor flavicollis*	Black Bittern	S
Ciconia stormi*	Storm's Stork	CE
Leptoptilos javanicus*	Lesser Adjutant	WCSE
bis davisoni*	White-shouldered Ibis	WCSE
Dendrocygna javanica*	Lesser Treeduck	E
Dendrocygna arcuata*	Wandering Treeduck	S
Anas querquedula*	Garganey	E
Nettapus coromandelianus*	Cotton Pygmy Goose	S
Aviceda jerdoni*	Jerdon's Baza	WCE
Pernis apivorus	Eurasian Honey-Buzzard	C
Elanus caeruleus*	Black-shouldered Kite	WCSE
Haliastur Indus	Brahminy Kite	WCSE
Haliaeetus leucogaster	White-bellied Sea-Eagle	WCSE
Icthyophaga nana*	Lesser Fish-Eagle	CE
Icthyophaga ichthyaetus*	Grey-headed Fish-Eagle	S
Spilornis cheela	Crested Serpent-Eagle	CS
Accipiter gularis	Japanese Sparrowhawk	C
Accipiter trivirgatus	Crested Goshawk	C
Ictinaetus malayensis	Black Eagle	e
Spizaetus alboniger*	Blyth's Hawk-Eagle	s
Microhierax fringillarius	Black-thighed Falconet	wcse
Coturnix chinensis*	Blue-breasted Quail	WCSE
Rollulus rouloul*	Crested Wood-Partridge	C
Lophura ignita*	Crested Fireback	C
Lophura erythrophthalna*	Crestless Fireback	C
Polyplectron malacense*	Malaysian Peacock-Pheasant	w
Argusianus argus*	Great Argus	WCE
Rallus striatus*	Slaty-breasted Rail	S
Porzana fusca*	Ruddy-breasted Crake	S
Porzana cinerea*	White-browed Crake	s
Amaurornis phoenicurus	White-breasted Waterhen Watercock	WCSE
Gallicrex cinerea*	Watercock	s
Gallinula chloropus*	Common Moorhen	s
Porphyrio porphyrio	Purple Swamphen	s
Irediparra gallinacea*	Comb-crested Jacana	s
Rostratula benghalensis*	Greater Painted Snipe	s
Pluvialis dominica	Lesser Golden Plover	CSE
Charadrius dubius*	Little Ringed Plover	CS
Charadrius leschenaultii	Greater Sand-Plover	CSE
Numenius phaeopus	Whimbrel	E
Tringa nebularia*	Common Greenshank	CSE
Tringa glareola	Wood Sandpiper	wcs
Xenus cinereus*	Terek Sandpiper	C
Actitis hypoleucos*	Common Sandpiper	WCSE
Arenaria interpres*	Ruddy Turnstone	CS
Gallinago stenura	Pintail Snipe	C
Gallinago megala	Swinhoe's Snipe	C
Calidris canutus*	Red Knot	C
Glareola maldivarum*	Oriental pratincole	w
Chlidonias hybrida*	Whiskered Tern	CSE
Sterna hirundo*	Common Tern	CE
Sterna sumatrana*	Black-naped Tern	CS

Sterna albifrona*	Little Tern	E
Sterna bergii*	Great Crested Tern	WCE
Treron curvirostra*	Thick-billed Pigeon	CE
Treron fulvicollis*	Cinnamon-headed Pigeon	WCE
Treron olax*	Little Green Pigeon	WCSE
Treron vernans*	Pink-necked Pigeon	C
Treron capellei*	Large Green Pigeon	WCSE
Ducula aenea	Green Imperial Pigeon	CS
Columba livia*	Rock Pigeon	CS
Macropygia phasianella*	Brown Cuckoo-Dove	CS
Geopelia striata*	Peaceful Dove	WCSE
Streptopelia chinensis	Spotted Dove	WCE
Chalcophaps indica	Green-winged Pigeon	CS
Psittacula alexandri*	Red-breasted Parakeet	WCSE
Psittacula longicauda*	Long-tailed Parakeet	WCE
Psittacula cyanurus*	Blue-rumped Parrot	WCSE
Loriculus galgulus*	Blue-crowned Hanging Parrot	WE
Cuculus vagans*	Moustached Hawk-Cuckoo	E
Cuculus fugax*	Hodgson's Hawk-Cuckoo	WCE
Cuculus micropterus*	Indian Cuckoo	WCSE
Cacomantis sonneratii*	Banded Bay Cuckoo	WCSE
Cacomantis merulinus*	Plaintive Cuckoo	C
Cacomantis variolosus*	Brush Cuckoo	WCE
Chrysococcyx xanthorhynchus*	Violet Cuckoo	SE
Chrysococcyx "malayanus"*	Malayan Bronze Cuckoo	WCSE
Surniculus lugubris*	Drongo Cuckoo	C
Phaenicophaeus diardi	Black-bellied Malkoha	C
Phaenicophaeus suroatranus	Chestnut-bellied Malkoha	WCE
Phaenicophaeus chlorophaeus	Raffles' Malkoha	C
Phaenicophaeus curvirostris	Chestnut-breasted Malkoha	C
Phaenicophaeus javanicus*	Red-billed Malkoha	W
Carpococcyx radiceus*	Sunda Ground-Cuckoo	WCE
Centropus rectunguis*	Short-toed Coucal	WCSE
Centropus sinensis*	Greater Coucal	WCSE
Centropus bengalensis*	Lesser Coucal	C
Phodilus badius*	Bay Owl	WC
Otus bakkamoena	Collared Scops-Owl	C
Otus rufescens*	Reddish Scops-Owl	WC
Bubo sumatranus	Barred Eagle-Owl	W
Ketupa ketupu	Buffy Fish-Owl	WCSE
Ninox scutulata	Brown Hawk-Owl	CSE
Batrachostomus.sp*	Frogmouth sp.	WCE
Eurostopodus temminckii*	Malaysian Eared Nightjar	CS
Caprimulgus macrurus*	Large-tailed Nightjar	C
Caprimulgus affinis*	Savanna Nightjar	w
Caprimulgus concretus*	Bonaparte's Nightj ar	c
Collocalia maxima*	Black-nest Swiftlet	WCE
Collocalia esculenta*	White-bellied Swiftlet	WCSE
Rhapidura leucopygialis	Silver-rumped Swift	CS
Apus pacificus*	Fork-tailed Swift	WCSE
Apus affinis*	House Swift	WCSE
Cypsiurus batasiensis	Asian Palm-Swift	WCSE
Hemiprocne longipennis*	Grey-rumped Treeswift	WCE
Hemiprocne comata	Whiskered Treeswift	WCSE
Harpactes kasumba*	Red-naped Trogon	WCSE
Harpactes diardi*	Diard's Trogon	WCSE
Harpactes duvaucelii*	Scarlet-rumped Trogon	W
Harpactes oreskios*	Orange-breasted Trogon	CSE
Alcedo atthis*	Common Kingfisher	WCSE
Alcedo meninting	Blue-eared Kingfisher	C
ftlcedo euryzona*	Blue-banded Kingfisher	WCSE

Ceyx erithaculrufidorsus*	Black/Rufous-backed Kingfisher	WCSE
Pelargopsis capensis*	Stork-billed Kingfisher	WC
Lacedo pulchella*	Banded Kingfisher	CSE
Halcyon coromanda*	Ruddy Kingfisher	WCE
Halcyon pileata*	Black-capped Kingfisher	CS
Halcyon chloris	Collared Kingfisher	C
Halcyon sancta*	Sacred Kingfisher	W
Halcyon concreta*	Rufous-collared Kingfisher	WCSE
Merops philippinus*	Blue-tailed Bee-eater	WCSE
Merops viridis*	Blue-throated Bee-eater	WCE
Nyctiornis amictus	Red-bearded Bee-eater	WCSE
Eurystomus orientalis	Dollarbird	WCE
Anorrhinus galeritus*	Bushy-crested Hornbill	C
Rhyticeros corrugatus*	Wrinkled Hornbill	WC
Rhyticeros undulatus*	Wreathed Hornbill	WCE
Anthracoceros malayanus*	Black Hornbill	WCSE
Anthracoceros convexus*	Southern Pied Hornbill	WCE
Buceros rhinoceros*	Rhinoceros Hornbill	WCE
Rhinoplax vigil*	Helmented Hornbill	WCSE
Megalaima chrysopogon*	Gold-whiskered Barbet	WCSE
Megalaima rafflesii*	Red-crowned Barbet	WCE
Megalaima mystacophanos*	Red-throated Barbet	WCE
Megalaima henricii*	Yellow-crowned Barbet	WCSE
Megalaima australis*	Blue-eared Barbet	WCE
Calorhamphus fuliginosus*	Brown Barbet	W
Indicator archipelagicus*	Malaysian Honeyguide	C
Sasia abnormis*	Rufous piculet	wcs
Micropternus brachyurus	Rufous Woodpecker	we
Picus puniceus	Crimson-winged Woodpecker	CS
Picus miniaceus	Banded Woodpecker	s
Dinopium javanense	Common Goldenback	WCE
Meiglyptes tristis	Buff-rumped Woodpecker	CS
Meiglyptes tukki	Buff-necked Woodpecker	WCE
Mulleripicus pulverulentus*	Great Slaty Woodpecker	WCSE
Dryocopus javanensis	White-bellied Woodpecker	C
Picoides canlcapillus*	Grey-capped Woodpecker	CS
Picoides moluccensis*	Brown-capped woodpecker	C
Hemicircus concretus	Grey-and-Buff Woodpecker	WCE
Blythipicus rubiginosus	Maroon Woodpecker	we
Chrysocolaptes validus	Orange-backed Woodpecker	WCE
Corydon sumatranus*	Dusky Broadbill	WCSE
Cymbirhynchus macrorhynchus*	Black-and-Red Broadbill	WCE
Eurylaimus javanicus*	Banded Broadbill	WCSE
Eurylaimus ochromalus*	Black-and-Yellow Broadbill	WCE
Calyptomena viridis*	Green Broadbill	WCE
Pitta moluccensis*	Blue-winged Pitta	WE
Pitta granatina*	Garnet Pitta	W
Mirafra javanica*	Singing Bushlark	S
Riparia riparia*	Sand Martin	C
Hirundo rustica*	Barn Swallow	WCSE
Hirundo tahitica*	Pacific Swallow	WCSE
Hemipus picatus	Bar-winged Flycatcher-Shrike	E
Hemipus hirundinaceus	Black-winged Flycatcher-Shrike	CSE
Coracina striata*	Bar-bellied Cuckoo-Shrike	C
Coracina fimbriata*	Lesser Cuckoo-Shrike	CS
Lalage nigra*	Pied Triller	WCSE
Pericrocotus igneus*	Fiery Minivet	C
Pericrocotus flammeus*	Scarlet Minivet	CS
Aegithina viridissima	Green lora	wC
Aegithina tiphia	Common lora	WCSE

Chloropsis cyanopoqon	Lesser Green Leaf bird	WCE
Chloropais sonnerati	Greater Green Leaf bird	WC
Pycnonotus zeylanicua	Straw-headed Bulbul	WCSE
Pycnonotus atriceps	Black-headed Bulbul	WCE
Pycnonotus aurigaster*	Sooty-headed Bulbul	C
Pycnonotus eutilotus	Puff-backed Bulbul	WCE
Pycnonotus goiavier	Yellow-vented Bulbul	WCSE
Pycnonotus plumosus	Olive-winged Bulbul	WCSE
Pycnonotus melanoecucos*	Black-and-White Bulbul	WC
Pycnonotus cyaniventris*	Grey-bellied Bulbul	WC
Pycnonotus simplex	Cream-vented Bulbul	C
Pycnonotus brunneus	Red-eyed Bulbul	CS
Pycnonotus erythropthalmos	Spectacled Bulbul	C
Criniger phaeocephalus	Yellow-bellied Bulbul	wC
Criniger bres*	Grey-cheeked Bulbul	C
Criniger finschii*	Finsch's Bulbul	C
Setornis criniger*	Hook-billed Bulbul	C
Hypsipetes charlottae	Buff-vented Bulbul	C
Dicrurus leucophaeua	Ashy Drongo	w
Dicrurus aeneus	Bronzed Drongo	WCE
Dicrurus paradiseus	Greater Racket-tailed Drongo	WCSE
Oriolus xanthonotus	Dark-throated Oriole	WCE
Irena puela	Asian Fairy-Bluebird	WCE
Platylophus galericulatus*	Created Jay	WCE
Platysmurus leucopterus*	Black Magpie	WCE
Corvus enca*	Slender-billed Crow	WCSE
Parus major*	Great Tit	CS
Sitta frontalis	Velvet-fronted Nuthatch	C
Pellorneum capistratua	Black-capped Babbler	WCE
Trichastoma malaccense	Short-tailed Babbler	we
Trichastoma rostratum	White-chested Babbler	WCE
Trichastoma bicolor	Ferruginous Babbler	WCE
Trichastoma abbotti	Abbott's Babbler	CSE
Malacopteron magnirostre	Moustached Babbler	C
Malacopteron magnum	Rufous-crowned Babbler	WCE
Halacopteron affine	Sooty-capped Babbler	WCE
Malacopteron cinereum	Scaly-crowned Babbler	WCE
Pomatorhinus montanus*	Chestnut-backed Scimitar-Babbler	CE
Napothera atrigularis*	Black-throated wren-Babbler	W
Stachyris rufifrons*	Rufous-fronted Babbler	CE
Stachyris poliocephala*	Grey-headed Babbler	S
Stachyris maculata	Chestnut-rumped Babbler	WCE
Stachyris leucotis*	White-necked Babbler	WE
Stachyris nigricollis	Black-throated Babbler	WCE
Stachyris erythroptera	Chestnut-winged Babbler	WCE
Macronus gularia	Striped Tit-Babbler	WCSE
Macronus ptilosus	Fluffy-backed Tit-Babbler	WCE
Alcippe brunneicauda	Brown Fulvetta	CE
Eupetes macrocercus*	Malaysian Rail-Babbler	WCE
Copsychus saularis	Magpie Robin	WCSE
Copsychus malabaricus*	White-rumped Shama	WCE
Copsychus m. stricklandi*	White-capped Shama	E
Copsychus pyrropygus*	Rufous-tailed Shama	CE
Enicurus leschenauiti*	White-crowned Forktail	WC
Enicurus ruficapillus*	Chestnut-naped Forktail	C
Gerygone sulphurea	Flyeater	CSE
Abroscopus superciliaris*	Yellow-bellied Warbler	C
Phylloscopus borealis*	Arctic Warbler	C
Acrocephalus sp*	? Clamorous Reed-Warbler	WSE
Locustella sp*	(Grasshopper warbler)	S

Orthotomus atrogularis	Dark-necked Tailorbird	WCSE
Orthotomus ruficeps	Ashy Tailorbird	WCSE
Orthotomus sericeus	Rufous-tailed Tailor bird	WCSE
Prinia flaviventris	Yellow-bellied Prinia	WCSE
Rhinomyias umbratilis*	Grey-chested Flycatcher	C
Ficedula dumetoria*	Rufous-chested Flycatcher	C
Cyornis turcosa*	Malaysian Blue Flycatcher	we
Cyornis rufigastra*	Mangrove Blue Flycatcher	cs
Rhipidura perlata	Spotted Fantail	C
Rhipidura javanica	Pied Fantail	WCSE
Hypothyinis azurea	Black-naped Monarch	we
Philentoma velatum*	Maroon-breasted Flycatcher	CE
Philentoma pyrhopterum*	Rufous-winged Flycatcher	WE
Terpsiphone paradisi	Asian paradise-Flycatcher	WCE
Pachycephala cinerea*	Mangrove Whistler	WC
Motacilla cinerea	Grey Wagtail	CE
Motacilla flava	Yellow Wagtail	CSE
Anthus novaeseelandiae	Richard's Pipit	SE
Artarmus leucorhynchus	White-breasted wood-Swallow	WCSE
Pityriasis gymnocephala*	Berneon Bristle-Head	C
Lanius tigrinus*	Tiger shrike	WC
Lanius cristatus*	Brown Shrike	C
Lanius schach*	Long-tailed Shrike	CSE
Aplonis panayensis*	Philippine Glossy Starling	WCSE
Sturnus philippenais*	Violet-backed Starling	S ?E
Sturnus contra*	Asian pied Starling	C
Acridotheres tristis*	Common Myna	CS
Gracula religiosa	Hill Myna	WCSE
Anthreptes malacencis*	Brown-throated Sunbird	WCSE
Anthreptes singalensis*	Ruby-checked Sunbird	C
Hypogramma hypograimnicum	Purple-naped Sunbird	C
Nectarinia sperata	Purple-throated Sunbird	cs
Nectarinia calcostetha*	Copper-throated Sunbird	cs
Nectarinia jugularis*	Olive-backed Sunbird	wcs
Aethopyga siparaja*	Crimson Sunbird	wcs
Arachnothera longirostra	Little Spiderhunter	we
Arachnothera crassirostris	Thick-billed Spiderhunter	we
Arachnothera robusta	Long-billed Spiderhunter	C
Arachnothera flavigaster	Spectacled Spiderhunter	C
Arachnothera affinis	Grey-breasted Spiderhunter	C
Prionochilus thoracicus	Scarlet-breasted Flowerpecker	WCE
Prionochilus maculatus	Yellow-breasted Flowerpecker	cs
Prionochilus percussus*	Crimson-breasted Flowerpecker	we
Prionochilus xanthopygius*	Yellow-rumped Flowerpecker	we
Dicaeum chrysorrheum	Yellow-vented Flowerpecker	WCSE
Dicaeum trigonostigma	Orange-bellied Flowerpecker	S
Dicaeum concolor*	Plain Flowerpecker	wcs
Dicaeum cruentatum*	Scarlet-backed Flowerpecker	cs
Dicaeum trochileum*	Scarlet-headed Flowerpecker	cs
Zosterops flava*	Javan white-eye Eurasian	E
Passer montanus*	Tree-Sparrow	cs
Padda oryzivora*	Java Sparrow	WCSE
Lonchura fuscans*	Dusky Munia	S
Lonchura leucogastra*	White-bellied Munia	S
Lonchura punctulata	Scaly-breasted Munia	WCS

APPENDIX 2
Glossary of place names mentioned in text. Should be used in conjunction with Figure 1. Province is given in brackets.

Alabio Polder (S). Deep water swamp west of Amuntai, under polder reclamation scheme.

Alalak (S). River NE of Banjarmasin.

Amuntai (S). Town on Negara River. 115°15'E, 2°25'S.

Bangkau Lake (S). Shallow lake on Negara river system. 115°12'E, 2°40'S.

Barambai (S). Town near Amuntai.

Basungkai (C). Settlement on lower Kapuas River south of Mandomai.

Bati-bati (S). Town on Banjarmasin - Pleihari road.

Belajau Lake (C). Alternative name for Sembuluh Lake. 112°20'E, 2°40'S.

Berau River (E). Major river at Tanjong Redeb.

Binuang (S). Town on Martapura - Rantau road. 115°05'E, 3°10'S. Bukitsua. Village on Rungan River M of Palangkaraya.

Cempaga River (C). Tributary of Sampit River at 113°05'E,-2°00'S.

Damar Island (C). Island off mouth of Katingan River at pegatan.

Hanjalipan (C). Village on Sampit River. 112°45', 2°13'S.

Kahayan River (C). River at Palangkaraya.

Kapuas River 1 (W). The biggest river of West Kalimantan.

Kapuas River 2 (C). Major tributary of lower Barito River.

Katingan River (C). Major river with mouth at Pegatan.

Kedangkepala River (E). Tributary of Mahakam River at Muara Ancalong.

Kedangpahu River (E). Tributary of Mahakam River at 115°50'E, 0°28'S.

Kanbang Island (S). Mangrove island in Barito River opposite Banjarmasin.

Ketapang (W). Coastal town on mouth of Pawan River. 109°58'E, 1°50'S.

Kuala Kurun (C). Town on Kahayan River. 113°53'E, 1°08'S.

Kumai (C). Town on river of same name. Ill 42'E, 2 45'S,

Loksado (S). 115°31'E, 2°49'S.

Lupak Dalam (C). Settlement on Kapuas River about 10 km from coast.

Mandonai (C). Village on lower Kapuas River. 114°24'E, 2°46'S.

Mantangai (C). Village on Kapuas River. 114°33'E, 2°28'S.

Marang (C). Village north of Palangkaraya.

Martapura (S). Town east of Banjarmasin.

Muara Ancalong (E). Village on Telen River. II6°O'E, 0°26'N.

Muara Joloi (C). Village on Upper Barito River. 114°06'E, 0°05'S.

Muara Kaman (E). Village at mouth of Kendangkepala River on the Mahakam.

Muara Wahau (E). Town on Telen River. 116°50'E, 1°03'N.

Murung River (C). Tributary of Barito River above Muara Joloi.

Nanga Merekai (W). Town on Ketungau River, 113°32'E, 0°40'N

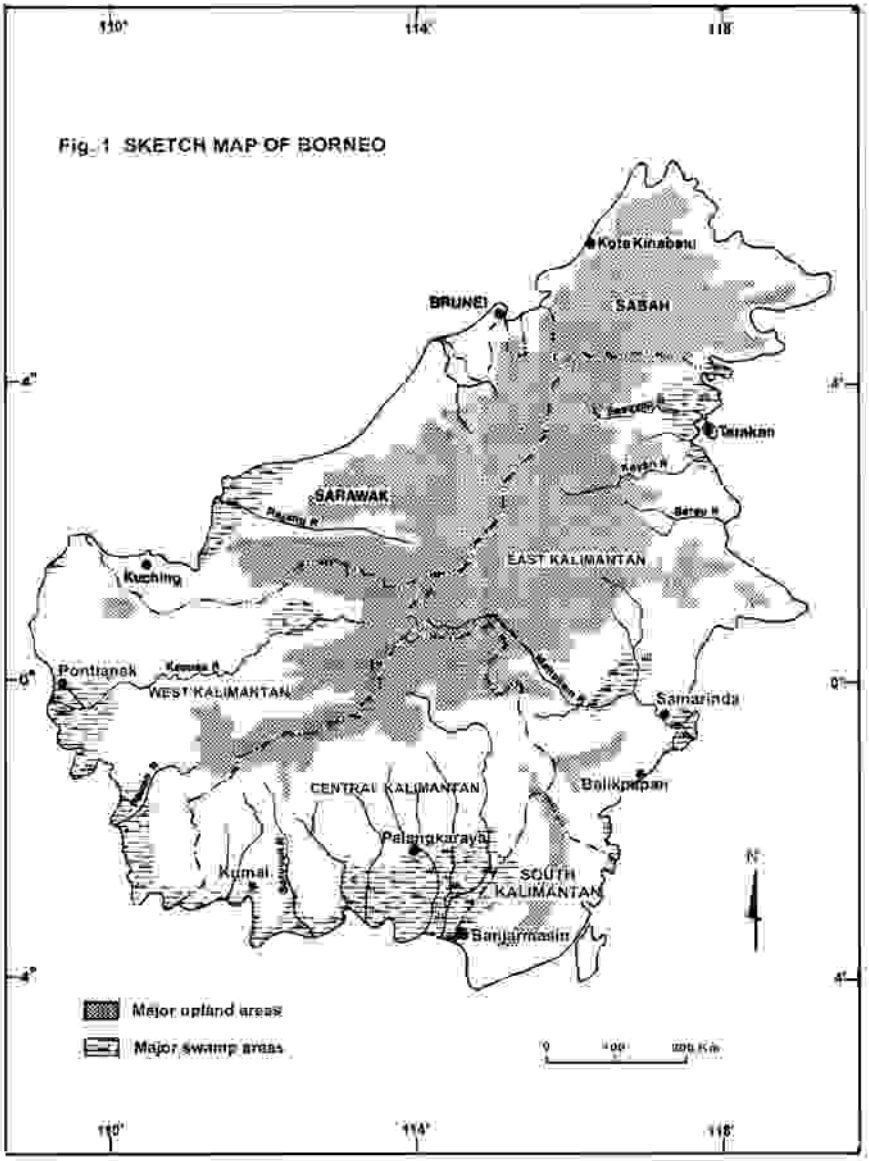


Fig. 1 SKETCH MAP OF BORNEO
110°
114°
118°
4°
0°
Kota Kinabalu
BRUNEI
SABAH
Tarakan
SARAWAK
EAST KALIMANTAN
Kuching
Pontianak
WEST KALIMANTAN
Samarinda
CENTRAL KALIMANTAN
Balikpapan
Palangkaraya
Kumai
SOUTH KALIMANTAN
Banjarmasin
N
Major upland areas
Major swamp areas
0
100
200 Km

Nanga Tayap (W). Town. 110°34'E, 1°32'S.

Pawan River (W). Major river at Ketapang.

Pegatan (C). Village at mouth of Katingan River. 113°20'E. 3°13'S.

pendahara (C). Village on Katingan River.

Peninggir (E). Village on Kedangpahu River. l^SO^E, 0°30'S.

pleihari (S). Town SE of Banjarmasin.

Pundu (C). Village on S. Cenpaga. 113°00'E, 2°00'S.

Rantau Pulut (C). Village on Seruyan river. 112°08'E, 1°56'S

Rawa Negara (S). Deep water swamp region on Negara River south of Amuntai.

Riam Kanan River and Reservoir (S). East of Martapura.

Rungan River (C). Tributary of Kahajan River above Palangkaraya.

Sambas (W). Town on river of same name. 109°20'E, 1°22'N.

Sandai (W). Town on Pawan River. 110°32"E, 1°14'S.

Sangkulirang (E). 118°00'E, 2°00'N.

Sebangau River (C). Swamp river between Katingan and Kahajan Rivers at 113°50'E, 3°00'S.

Seigohong (C). Village on Rungan River. ll3°47'E, 1°52'S.

Sekonyer river (C). Forms western boundary of Tanjong Puling National Park.

Sekatak River (E). 117°10'E, 3°17'M.

Sembuluh Lake (C). Alternative name for Belajau Lake on lower Seruyan River.

Seruyan River (C). Major river at 112°10'E, 2°00'S.

Sesayap (E). Village on river of same name at 117°00'E, 3°35'N.

Singkawang (W). Town on NW coast.

Sintang (W). Town on Kapuas River.111°30'E, 0°05'N.

Sukamandang (C). Village on Seruyan River. 112°11E, 2°04'S.

Takisung (S). Village on coast at Pleihari.

Talisayan (E). Village on coast. 118°11'E, 1°37'N.

Tanah Merah (W). Village on Pawan River below Sandai.

Tanjung Isuy (E). Village on Mahakam lakes. U6°10'E, 0°30'S.

Tanjong Pinang. Village on Kahajan River. 114°02'E, 2°09'S.

Tanjong Redeb CE). Town on Berau River. 117°30'E, 2°10'N.

Tanjong Selor (E). Town on Kajan River. 117°27'E, 2°50'N.

Tarakan (E). Town on island off coast of NE Kalimantan.

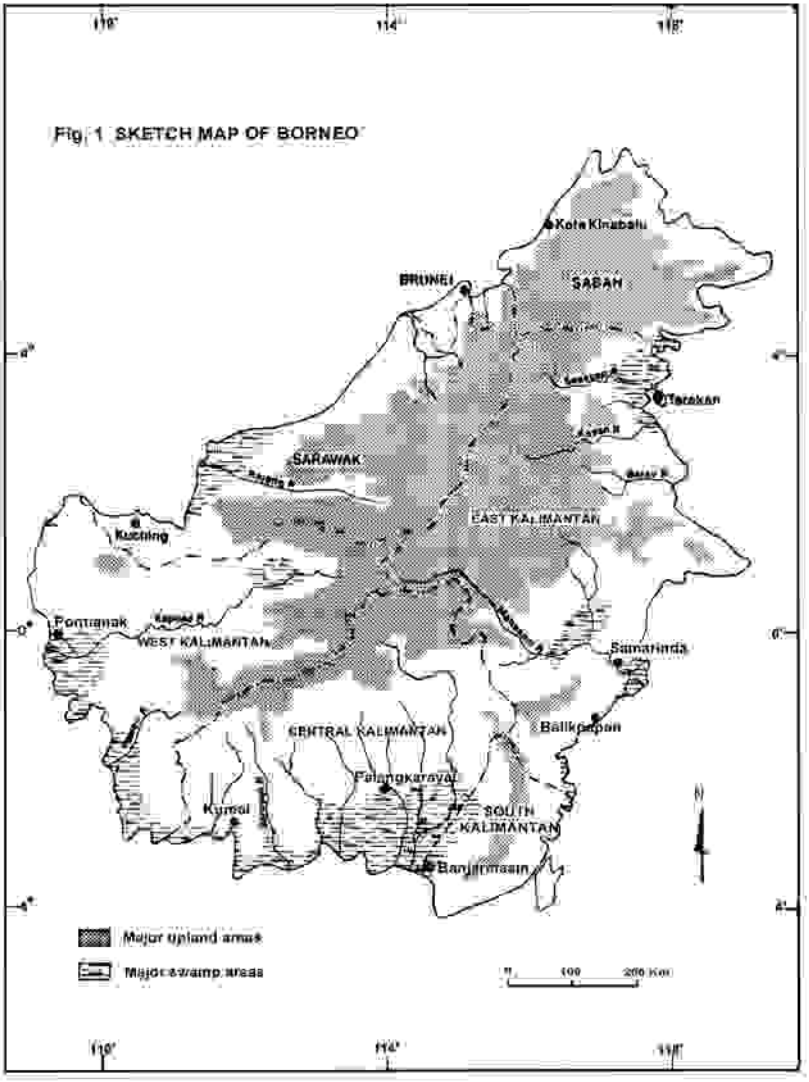
Telen River (E). Tributary of Kedangkapala River at Muara Ancalong.

Teluk Jolo (C). Village on upper Barito River. 114°07'E, 0°21'S.

Tenggarong (E). Town on Mahakam River above Samarinda.

Tidung pala (El. Village above the major loop of the Sesayap River. 116°55'E, 3 35'M.

Tumbangmarikoi (C). Village on Kahajan River. 113°23'E, 0°48'S.



Dates of residenc of K. Burton and T. Gula are given in the introduction. D.A Holmes made visits to Kalimantan on the following dates (in anticlockwise order):

Pontianak - S. Sambas (W), 23 - 25 March 1982.

Sintang, via S. Ketungau to Nanga Merekai (W), 17 - 23 October 1981.

Ketapang, via S. Pawan to Sandai and Nangatayap (N), 8-17 August and 25 November-6 December 1981.

Kumai, via S. Kumai and cross-country to S. Seruyan at Rantau Pulut, and Sukamandang to Kalang (C),.26 January -2 February 1983, and 3-12 April 1984.

Sampit, via S. Cempaga to Pundu (Cl, 6-13 Decaber 1982. Binuang region (S), 5-20 December 1974.

Banjarnasin region, north to Amuntai, Alabio Polder, Bangkau Lake and Rawa Negara (S), 16-24 Novanber 1978.

Samarinda, via S. Mahakam to Tanjung Isuy and S. Kedangpahu to Peninggir (E), 16-25 July 1964.

Samarinda, via S. Mahakara and S. Telen to Muara Ancalong and Muara Wahau (E), 8-15 April 1985.

Tanjung Redeb, via S. Berau and open sea to Talleayan (E), 15-21 Noveober 1985.

Tarakan, via S. Sesayap to Tidung Pala and S. Sekatak (E), 4-10 March 1985.

APPENDIX 3

List of major conservation areas.

West Kalimantan

Gunung Nyiut. Wildlife refuge. 150,000 ha, max. elevation 1709 m. 100°OO'E, 1°00'N.

Gunung Palung. Proposed as national park, 100,000 ha, max. elevation 1160 m. 110°10'E, 1°15'S.

Muara Kendawangan. Proposed nature reserve. 150,000 ha. Coastal swamps. 110°20'E, 2 45'S.

Danau Sentarum. Proposed wildlife refuge. 80,000 ha. Kapuas lakes and swamps. 112 15"E, 0 55'N.

Gunung Bentuang and Karimun. Proposed nature reserve. 600,000 ha, max. elevation 1960 m. Adjacent to Lanjak Entlaau reserve in Serawak 110 15'E, 0°50'N.

Hutan Sambas. Proposed nature reserve. 120,000 ha. Lowland forest. 109°20'E, 1°50'N.

Bukit Perai. Proposed nature reserve. 100,000 ha. Max. elevation 1200 m. 111°10'E, 1 10'S.

Bukit Baka. Nature reserve. 100,000 ha, adjacent to Bukit Raya in Central Kalimantan.

Bukit Rongga. Proposed nature reserve. 110,000 ha.

Central Kalimantan

Tanjong Puting. National park. 305,000 ha. Lowland and swamp. Extension area of 70,000 ha proposed. 110 50'E, 3°00'S,

Bukit Raya. Nature reserve. 100,000 ha, adjacent to Bukit Bata in West Kalimantan. Mountains. Max. elevation 2278 m. Extension area of 60,000 ha proposed. 112°40'E, 0°40'S

Bukit Batikap. Proposed nature reserve. 740,000 ha.

Hutan Kahayan. Proposed nature reserve. 150,000 ha.

South Kalimantan

Pleihari Martapura, Wildlife reserve. 30,000 ha, with proposed-extension of 125,000 ha. Max. elevation 1170 m. Hill forest (some severely disturbed). 115°10'E, 3°45'S.

Meratus Hulu. Two reserves with a combined area of 246,000 ha. Max. elevation 1907 m. Hill and montane forest (some disturbed). 115°40*E, 2°45-S.

East Kalimantan

Kutai. National Park. 200,000 ha with proposed extension. Lowland, parts disturbed and logged, and these areas destroyed by fire in 1982/1983. Value of reserve now severely reduced.

Muara Kaman. Nature reserve, 62,000 ha. Peat swamp, now severely damaged by fire.

Pantai Samarinda. Proposed nature reserve. 95,000 ha. River estuary. Sangkulirang.proposed national park. 100,000 ha. Includes limestone karst. Sungai Berambai. Proposed nature reserve. 110,000 ha. Lowland.

Mahakam Lakes. Proposed wildlife refuge. 200,000 ha. Disturbed, damaged by 1982/1983 drought and fires.

Long Bangun. Proposed nature reserve. 350,000 ha. Max. elevation 1380 m. Lowland and submontane.

Kayan-Mentarang. Nature reserve. 1,600,000 ha of the NW corner of the province adjacent to Sarawak. Hill and montane. Max. elevation 2558 m. Includes many disturbed areas.

Sungai Kayan. Proposed national park. 150,000 ha. Gunung Berau. proposed nature reserve. 110,000 ha. Lowland up to 750 m.

Thus provisionally quite significant areas are proposed strictly for nature conservation, with in addition many montane and coastal areas afforded some degree of protection under the status of "protection forest". In practice, disturbance may be quite severe in several of these areas, both for hunting and shifting cultivation, while the richest forests of the lowlands are inadequately protected and under greatest risk. As noted earlier, shifting cultivation is very widespread in some areas and spreading rapidly. Even before the forest fires of 1982/1983, the lowland forests of Kutai National Park had been severely disturbed.

The list is not complete and there are several smaller reserves, Including coastal mangroves and off-shore islands, some of which are important. Further revisions and proposals are being made, and we would add our own recommendations for the Sangkulirang limestone area. Individual spectacular karst blocks have already been proposed, but a representative area Of lowland limestone forest such as that at Talisayan should also be included.

Source ; UNDP/FAO 1981. National conservation plan for Indonesia, Vol,V. Kalimantan.
Field report of UNDP/FAO National Parks development Project INS/78/061. Bogor.
Prepared for the Directorate of Nature Conservation, Government of Indonesia.