CHECKLIST OF WILDLIFE SPECIES RECORDED IN THE LOWER KINABATANGAN, SABAH.

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ABSTRACT: A checklist of wildlife recorded in the Lower Kinabatangan in eastern Sabah is presented. Surveys for wildlife were carried out mainly in and around two areas, Sukau and Abai. This list although not exhaustive provides further information on species distribution. The lower Kinabatangan area has a high diversity and density of wildlife, apart from having the largest floodplain and the largest intact mangrove in Sabah.

INTRODUCTION

This paper presents a checklist of wildlife species in the Lower Kinabatangan, eastern Sabah (figure 1), recorded during a two-year study on *Nasalis larvatus* (Boonratana, 1993a), and an eleven-month wildlife survey (Sharma, 1992) in the region. The main aims of the two-year study were to describe the feeding and ranging behaviour, and social organization of *N. larvatus* in relation to its habitat. While studying *N. larvatus*, many other animal species were also seen, heard, or their signs encountered. The main aim of the eleven-month wildlife survey was to record the presence and estimate the abundance of wildlife fauna.

METHODS

Fieldwork to study the behaviour and ecology of *N. larvatus* was conducted from January 1990 to December 1991 inclusive. The study was carried out at Sukau (118° 30'E, 5° 30'N), and Abai (118° 22'E, 5° 04'N), within the Lower Kinabatangan region. During this period, the presence of wildlife fauna was recorded both opportunistically and systematically, based on actual sightings and on evidence made by the animals such as vocalizations, dung, tracks, nest, etc. Opportunistic recording were carried out when conducting river surveys and full-day follows for *N. larvatus* (Boonratana, 1993a), whereas systematic surveys using the line transect method (Burnham *et al.*, 1980) were carried out by walking ten one-kilometer long straight line transects (Sharma, 1992, Boonratana, 1993a). Transects were placed on both sides of the Menanggul River in the Sukau study area at the 1st, 3rd, 5th, 7th and 9th kilometer mark, and were perpendicular to the river's edge. Each transect was walked once a month between 0630

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to 1130 hours. Occasionally, night surveys by boat were carried out along portions of the Kinabatangan River and its tributaries.

STUDY AREA

The Lower Kinabatangan region is mostly under forest on flat land subjected to different degrees of disturbance. Open water, hills, villages and plantations are sparsely scattered throughout (Payne, 1989). The Kinabatangan River is Sabah's largest river, with a length of 560 km, and a catchment area of 16,800 km² (Scott, 1989). The Kinabatangan floodplain, measuring approximately 280,000 ha, is the largest and most important wetland in Sabah (Scott, 1989). There are many ox-bow lakes in the area from the middle reaches of the river down to the coastal plains, which are at various stages of infilling (Boonratana, 1993a). It has a humid tropical climate with an average annual rainfall of about 2,600 mm, and mean diurnal temperatures range from 22°C to 32°C (Scott, 1989).

The region has a complex mixture of natural vegetation (figure 2). At Sukau, the principal types in the flood-prone areas are riverine forest and freshwater swamp forest. There are also some open reed swamps. In the flood-free zone, there are remnants of pristine lowland dipterocarp forest, logged-over swamp forest and burnt lowland dipterocarp forest, and cocoa and oil palm plantations (Boonratana, 1993a). At Abai, the principal vegetation is mangrove forest with extensive stands of *Nypa fruticans* at the inland edge and the upper tidal limit of the estuaries. Upriver from this, beyond the influence of seawater, riverine forest and lowland swamp forest dominate in the seasonally flood-prone zone. Transitional forest exists where mangrove forest intergrades to riverine forest. There are also some forests on steep hills and flat ground (Boonratana, 1993a).

RESULTS

A checklist of mammals, birds and reptiles recorded at Sukau and Abai is given in Table 1. Only those species whose presence was recorded during the study period are included in the list. At Sukau, there at least 51 mammals species including two volant mammals, and 195 birds species. Ten primate species were found in the area, four of which were Bornean endemics namely N. larvatus, P. rubicunda (P.r. rubicunda and P.r. chrysea), and Hylobates muelleri. The other primates were Pongo pygmaeus, Presbytis cristata, Macaca nemestrina, M. fascicularis, Nycticebus coucang and Tarsius bancanus. This is one of only two known sites in Asia with ten primate species, and one of only two known sites in the world with four sympatric colobines, the other being Danum Valley Protection Forest Reserve, also in Sabah (Boonratana, 1993a, b & c; 1995; Boonratana & Sharma, 1994).

Other large mammals found in the area included Elephas maximus, Bos javanicus, Cervus unicolor, Muntiacus muntjak, Helarctos malayanus, Neofelis nebulosa, Felis

planiceps, F. bengalensis, Sus barbatus and the critically endangered Dicerorhinus sumatrensis (Boonratana, 1993a; Boonratana & Sharma, 1994). All eight species of hornbills found in Borneo were recorded in the area. Five Bornean endemic birds occurred here, namely Lonchura fuscans, Pityriasis gymnocephala, Ptilocichla leucogrammica, Cyornis superbus and Pitta baudi. The ox-bow lakes were important breeding grounds for Anhinga melanogaster and Crocodylus porosus, both of which are becoming rare in other parts of northern Borneo (Boonratana, 1993a; Boonratana & Sharma, 1994).

At Abai, 17 non-volant mammal species and 75 bird species were found. The primate sighted at Abai were N. Iarvatus, P. hosei, P.r. rubicunda, P.r. chrysea, P.cristata, M. nemestrina, M. fascicularis, H. muelleri and P. pygmaeus. Other large mammals found included E. maximus, D. sumatrensis, B. javanicus, C. unicolor, H. malayanus and S. barbatus. All eight hornbill species were observed in the area. There were two Bornean endemic birds, Pityriasis gymnocephala and Lonchura fuscans, Treron fulvicollis, T. olax and Psittacula longicauda were particularly common. It probably was an important site for Leptoptilos javanicus and the rare Cinona stormi. Crocodylus porosus although not common was also present (Boonratana, 1993a).

CONCLUSIONS

The Lower Kinabatangan area has a high diversity and abundance of wildlife, in particular primates, of which ten species are found in the area. Also of great importance, is the presence of *D. sumatrensis* and *B. javanicus* in the region. For both species, this is one of the few remaining populations in the world. Both these mega-herbivores are rapidly declining towards extinction unless drastic measures are taken. Furthermore, the area probably has the highest population of *N. larvatus* in Sabah.

Although the checklist given in this paper is not exhaustive, it nevertheless includes species not previously recorded in the area and helps to provide additional information to the distribution of wildlife in Borneo. Beside being important to wildlife, the Kinabatangan floodplain, measuring 280,000 ha, is the largest and possibly the most important wetland in Sabah. Also the area has the largest intact mangrove in the state, measuring approximately 40,500 ha. Thus, it is of the utmost importance immediately to conserve the lower Kinabatangan area to ensure that all of its endangered and diverse wildlife is preserved.

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Table 1. -- List of wild fauna recorded at Sukau and Abai².

* criteria for recording wild fauna:-

- 1 visual sighting
- 2 vocalization
- 3 tracks
- 4 dung
- 5 nests
- 6 other signs (wallows, claw marks, etc.)

Mammals

Common name	Scientific name	Sukau	Abai
Common treeshrew	Tupaia glis	1*	
Slender treeshrew	Tupaia gracilis	1	
Striped treeshrew	Tupaia dorsalis	1	
Large treeshrew	Tupaia tana	1	
Dusky roundleaf bat	Hipposideros ater	1	
Large flying fox	Pteropus vampyrus	1	
Slow loris	Nycticebus coucang	1	
Western tarsier	Tarsius bancanus	1	
Hose's langur	Presbytis hosei	1	1
Maroon langur	Presbytis rubicunda rubicunda	1	1
	P.r. chrysea	1	1
Silvered langur	Presbytis cristata	1	1
Probiscis monkey	Nasalis larvatus	1	1
Long-tailed macaque	Macaca fascicularis	1	1
Pig-tailed macaque	Macaca nemestrina	1	1
Bornean gibbon	Hylobates muelleri	1,2	1,2
Orangutan	Pongo Pygmaeus	1,2,5	1,2,5
Pangolin	Manis javanica	1,6	
Giant squirrel	Ratufa affinis	1,2	
Prevost's squirrel	Callosciurus prevostii	1	
Plantain squirrel	Callosciurus notatus	1	
Ear-spot squirrel	Callosciurus adamsi	1	
Horse-tailed squirrel	Sundasciurus hippurus	1	
Slender squirrel	Sundasciurus tenuis	1	
Plain pigmy squirrel	Exilisciurus exilis	1	
Low's squirrel	Sundasciurus Iowii	1	

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3,4	3,4
1,2,3,4	
	1,3 1,3 1,2,3 3 1,3,5 1,3 1,3 1,3,4 3,4

²Taxonomy for mammals follow Payne et al., 1985; and taxonomy for birds follow MacKinnon & Phillipps, 1993.

Birds

Common name	Scientific name	Sukau	Abai
Oriental darter	Anhinga melanogaster	1	1
Great-billed	Ardea sumatrana	1	
Purple heron	Ardea purpurea	1	1
Great egret	Egretta alba	1	1
Intermediate egret	Egretta intermedia	1	1
Little egret	Egretta garzetta	1	

Chinese egret	Egretta eulophotes	1	1
Cattle egret	Bubulcus ibis	1	1
Striated heron	Butorides striatus	1	1
Yellow bittern	Ixobrychus sinensis	1	
Cirnamon bittern	Ixobrychus cinnamomeus	1	
Black bittern	Dupetor flavicollis	1	
Storm's stork	Cicona stormi	1	1
Lesser adjutant	Leptoptilos javanicus		1
Bat hawk	Machearamphus alcinus		1
Jerdon's baza	Aviceda jerdoni	1	
Oriental honey-buzzard	Pernis ptilorhynchus	1	
Brahminy kite	Haliastur indus	1	1
Crested goshawk	Accipiter trivirgatus	1	
White-bellied sea-eagle	Haliaeetus leucogaster	1	1
Grey-headed fish-eagle	Ichthyophaga ichthyaetus	1	
Lesser fish-eagle	Ichthyophaga humilis	1	
Crested serpent-eagle	Spilornis cheela	1	1
	Pandion haliaetus	1	
Osprey Chestnut-necklaced partridge	Arborophila charltoni	1	
Crested wood partridge	Rollulus rouloul	1	
Crested wood partriage Crested fireback	Lophura ignita	1	1
Great argus	Argusianus argus	1	1
White-breasted waterhen	Amaurirnis phoenicurus	1	1
Malaysian plover	Charadrius peronii	1	
Common sandpiper	Actitis hypoleucos	1	1
Large green pigeon	Treron capelli	1	
Thick-billed green pigeon	Treron curvirostra	1	
Cinnamon-headed pigeon	Treron Fulvicollis	1	1
Little green pigeon	Treron olax	1	1
Pink-necked green pigeon	Treron vernans	1	
Jambu fruit dove	Ptilinopus jambu	1	1
Green imperial pigeon	Ducula aenea	1	1
Grey imperial pigeon	Ducula pickeringi	1	1
Zebra dove	Geopelia strata	1	
Emerald dove	Chalcophaps indica	1	
	Psittacula longicauda	1	1
Long-tailed parakeet	Loriculus galgulus	1	
Blue-crowned hanging-parrot Blue-throated bee-eater	Merops viridis	1	1
Blue-tailed bee-eater	Merops virtuis Merops philippinus	i	
Dollarbird	Eurystomus orientalis	1	1
Hodgson's hawk-cuckoo	Cuculus fugax	1	1
Moustached hawk-cuckoo	Cuculus vagans	1	
Plaintive cuckoo	Cacomantis merulinus	1	
Violet cuckoo	Chrysococcyx xanthorhynchus	1	
	Surniculus lugubris	1	
Drongo cuckoo	Durmeum inguoin		

Raffle's malkoha	Pheanicophaeus chlorophaeus	1	
Red-billed malkoha	Phaenicophaeus javanicus	1	
Chestnut-breasted malkoha	Phaenicophaeus curvirostris	1	1
Greater coucal	Centropus sinensis	1	1
Short-toed coucal	Centropus rectunguis	1	
Lesser coucal	Centropus bengalensis	1	
Sunda ground-cuckoo	Carpococcyx radiceus	1	
Reddish scops-owl	Otus rufescens	1	
Buffy fish-owl	Ketupa ketupu	1	
Brown wood-owl	Strix leptogrammica	1	
Gloud's frogmouth	Batrachostomus stellatus	1	
Malaysian eared nightjar	Eurostopodus temminckii	1	
Glossy swiflet	Collocalia esculenta	1	
Silver-rumped swift	Ramhidura leucopygialis		1
Asian palm-swift	Cypsiurus balasiensis	1	1
Whiskered treeswift	Hemiprocne comata	1	1
Pasific swallow	Hirundo tahitica	1	1
Barn swallow	Hirundo rustica	1	
Diard's trogon	Harpactes diardii	1	
Red-naped trogon	Harpactes kasumba	1	
Scarlet-rumped trogon	Harpactes duvaucelii	1	
Banded kingfisher	Lacedo pulchella	1	
Rufous-collared kingfisher	Actenoides concretus	1	
Collared kingfisher	Todirhamphus chloris		1
Ruddy kingfisher	Halcyon coromanda	1	
Black-capped kingfisher	Halcyon pileata		1
Stork-billed kingfisher	Pelargopsis capensis	1	
Common kingfisher	Alcedo atthis	1	
Blue-eared kingfisher	Alcedo meninting	1	1
Black-backed kingfisher	Ceyx erithacus	1	
Rufous-backed kingfisher	Ceyx rufidorsa	1	
White-crowned hornbill	Aceros comatus	1	1
Bushy-crested hornbill	Anorrhinus gsleritus	1	1
Wrinkled hornbill	Aceros corrugatus	1	1
Wreathed hornbill	Aceros undulatus	1	1
Black hornbill	Anthracoceros malayanus	1,2	1,2
Pied hornbill	Anthracoceros coronatus	1,2	1,2
Rhinoceros hornbill	Buceros rhinoceros	1,2	1,2
Helmeted hornbill	Buceros vigil	1,2	1,2
Brown barbet	Calorhamphus fulignosus	1	
Red-crowned barbet	Megalaima rafflesii	1	
Red-throated barbet	Megalaima mystacophanos	1	1
Yellow-crowned barbet	Megalaima henricii		1
Blue-eared barbet	Megalaima australis	1	1
Rufous piculet	Sasia abnormis	1	1

Crimson-winged woodpecker	Picus puniceus	1		
Banded woodpecker	Picus minaceus	1		
Rufous woodpecker	Celeus brachyurus	1		
Sunda woodpecker	Picoides moluccensis	1		1
Buff-necked woodpecker	Meiglyptes tukki	1		
Grey-and-buff woodpecker	Hemicircus concretus		1	
Common goldenback	Dinoplum javanense	1		1
Greater goldenback	Chrysocolaptes lucidus			1
Olive-backed woodpecker	Dinoplum rafflesii	1		
White-bellied woodpecker	Dryocopus javensis	1		1
Great slaty woodpecker	Mulleripicus pulverulentus	1		
Orange-backed woodpecker	Reinwardtipicus validus	1		
Black-and red broadbill	Cymbirhynchus macrorhynchus	1		1
Black-and-yellow broadbill	Eurylaimus ochromalus	1		
Banded broadbill	Eurylaimus javanicus	1		
Garnet pitta	Pitta granatina	1		
Blue-headed pitta	Pitta baudii	1		
Banded pitta	Pitta guajana	1		
Hooded pitta	Pitta sordida	1		
Black-winged flycatcher-shrike	Hemipus hirundinaceus	1		
Bar-winged flycatcher-shrike	Hemipus picatus	1		
Ashy minivet	Pericrocotus divaricatus	1		
White-breasted wood-swallow	Artamus leucorhynchus	1		
Green iora	Aegithina viridissima			1
Common iora	Aegithina tiphia	1		1
Lesser green leafbird	Chloropsis cyanopogon	1		1
Greater green leafbird	Chloropsis sonnerati	1		
Asian fairy bluebird	Irena puella	1		
Puff-backed bulbul	Pycnonotus eutilotus	1		
Black and white bulbul	Pycnonotus melanoleucos	1		
Black-headed bulbul	Pycnonotus atriceps	1		1
Straw-headed bulbul	Pycnonotus zeylanicus	1		
Yellow-vented bulbul	Pycnonotus goiavier	1		
Cream-vented bulbul	Pycnonotus simplex	1		
Spectacled bulbul	Pycnonotus erythrophalmos	1		
Grey-cheeked bulbul	Alophoixus bres	1		
Yellow-bellied bulbul	Alophoixus phaeocephalus	1		
Finsch's bulbul	Criniger finschii	1		
Hairy-backed bulbul	Tricholestes criniger	1		
Streaked bulbul	Ixos malaccensis	1		
Buff-vented bulbul	Iole alivacea	1		
Rufous-tailed shama	Trichixos pyrrhopygus	1		
Magpie robin	Copsychus saularis	1		1
White-browed shama	Copsychus stricklandi	1		
White-crowned forktail	Enicurus leschenaulti 1			

Malaysian rail-babbler	Eupetes macrocerus		1	
Black-capped babbler	Pellorneum capistratum	1		
Short-tailed babbler	Malacocincla malaccense		1	
White-chested babbler	Trichastoma rostratum		1	
Ferruginous babbler	Trichostoma bicolor		1	
Horsfield's babbler	Malacocincla sepiarium		1	
Abbott's babbler	Malacocincla abbotti		1	1
Rufous-crowned babbler	Melacopteron magnum		1	
Scaly-crowned babbler	Melacopteron cinereum		1	
Sooty-capped babbler	Melacopteron affine	1		
Grey-breasted babbler	Melacopteron albogulare		1	
Bornean wren-babbler	Ptilocichla leucogrammica		1	
Striped wren-babbler	Kenopia striata		1	
Striped tit-babbler	Macronous gularis		1	
Fluffy-backed tit-babbler	Macronous ptilosus		1	
Grey-headed babbler	Stachyris poliocephala		1	
Black-throated babbler	Stachyris nigricollis		1	
Chestnut-rumped babbler	Stachyris maculata		1	1
Chestnut-winged babbler	Stachyris erythroptera		1	
Rufous-fronted babbler	Stachyris rufifrons		1	
Brown fulvetta	Alcippe brunneicauda		1	
White-bellied vuhina	Yuhina zantholeuca		1	
Golden-bellied gerygone	Gerygone sulphurea		1	
Yellow-bellied prinia	Prinia flaviventris		1	
Dark-necked tailorbird	Orthotomus atrogularis		1	
Rufous-tailed tailorbird	Orthotomus sericeus		1	
Ashy tailorbird	Orthotomus ruficeps		1	1
Pied fantail	Rhipidura javanica		1	1
Blue-and-white flycatcher	Cyanoptila cyanomelana		1	
White-tailed blue flycatcher	Cyornis concretus		1	
Malaysian blue flycatcher	Cyornis turcosus		1	1
Large-billed blue flycatcher	Cyornis caerulatus		1	
Bornean blue flycatcher	Cyornis superbus		1	
Rufous-chested flycatcher	Ficedula dumetoria		1	
Rufous-winged philentoma	Philentoma pyrhopterum		1	
Maroon-breasted philentoma	Philentoma velatum		1	
Black-naped monarch	Hypothymis azurea		1	
Asian paradise flycatcher	Terpsiphone paradisi		1	1
Velvet-fronted nuthatch	Sitta frontalis			1
Yellow-breasted flowerpecke	r Prionochilus maculatus		1	
Scarlet-backed flowerpecker	Dicaeum cruentatum		1	
Orange-bellied flowerpecker	Dicaeum trigonostigma		1	
Plain sunbird	Anthreptes simplex		1	
Plain-throated sunbird	Anthreptes malacensis		1	
Ruby-cheeked sunbird	Anthreptes singalensis		1	

Water monitor lizard	Varanus salvator		1	1
Estuarine crocodile	Crocodylus porosus		1,3	1
Malaysian giant tortoise	Orlitia borneensis		1	
Malayan box tortoise	Cuora amboinensis		1	
Malayan flat-shelled tortoiseA	lotochelys platynota	1		

Amphibians

Common name	Scientific name	Sukau	Abai
Greater swamp frog	Rana ingeri	1	
Green paddy frog	Rana erthraea	1	
Cricket frog	Rana nicobariensis	1	
White-lipped frog	Rana chalconata	1	