

Mammals of Maliau Basin Conservation Area, Sabah, Malaysia: A preliminary study

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ABSTRACT. Small mammal trappings were conducted for 708 trap-nights in the Maliau Basin Conservation Area from 26 February to 10 March 2005. Twenty-five individuals of small mammals, comprising of 12 species, were captured. In addition, six species of large mammals were recorded. No large herbivores were directly sighted during the wildlife surveys. Tracks of wild pigs were recorded along the trail to the Camel Trophy Camp.

Keywords: Mammals, Maliau Basin.

INTRODUCTION

The Maliau Basin Conservation Area (MBCA), also known as “The Lost World”, was originally part of the 10,000 km² timber concession held by Yayasan Sabah (Sabah Foundation). Though slated for logging in 1970, the basin continued to resist nearly all attempts to breach its formidable defences until 1981. The basin is elevated at more than 950 m a.s.l with the highest peak Gunung Lutong, lurking over 1900 m a.s.l over the Inarad villages to the northwest. The basin is covered mainly by two forest types: lower montane hill forest and submontane heath forest (Anon., 2002).

A scientific expedition was conducted by Universiti Malaysia Sabah and Sabah Foundation in two phases, from 25 February to 24 March 2005, with the objectives to explore and to document the biodiversity in the MBCA, in order to prepare a conservation

management plan for the unique habitat. Prior to this expedition, two scientific expeditions were carried out in MBCA.

The first scientific expedition that was carried out in 1988 documented a variety of scientific findings: geology, soil, hydrology, geomorphology, climate, plant studies, animal studies and human impacts, with recommendations for future management. The second scientific expedition conducted in 1996, aimed to document the uniqueness of the Maliau Basin in an effort to conserve it, by preparing an inventory of flora and fauna of and reassessment of the hydrology system of Maliau Basin as a water catchment area.

In the present expedition, a number of surveys have been conducted, starting from Ginseng Camp and its surroundings, up to Lobah Camp till Maliau Falls, within the dipterocarp and riverine forests. A survey from Ginseng Camp to Camel Trophy and its surrounding areas was also conducted including the heath forest. The objectives of this surveys were to document and to prepare a checklist of mammals within MBCA.

MATERIAL AND METHODS

Fifty-four live-cage traps, two harp traps and 12 mist nets were flown from Agathis Camp to Ginseng Camp to trap small mammals, including bats. Bananas were used as baits at the sampling areas around Ginseng Camp,

except in Camel Trophy, where biscuits and sardine sauce were used as baits. In addition to trappings of live animals, the presence of mammals were detected using camera-trap and based on field signs. Mammal surveys were conducted from 26 February to 10 March.

Trapping with live-cage traps

This method was applied in order to trap the non-volant small mammals. In this survey, 50 traps were set on a 50 x 50 m grid along Sabandar River for six days. On the seventh day, the traps were moved to trails near the Ginseng Camp, within a dipterocarp forest for another four days. A survey was also conducted along the trail at Camel Trophy Camp for two days within the heath forest. The traps were laid on the ground on animal trails and near crevices of roots. The traps were checked daily between 0800-1200 hours. Captured animals were taken out from the trap into a cotton bag, and taken back to the camp to be measured,

weighed and tagged with ear tags, after being anaesthetized with ether. Captured animals were released into the wild, except several rare species which were preserved as zoological specimens.

Mist netting

Mist nets and harp traps were used to trap bats. Both mist nets and harp traps were set between 2 m to 5 m above the ground. Three mist nets and a harp trap were set up along the Sabandar River for six consecutive days (Table 1). Another nine mist nets and a harp trap were set along the 1 km trail near the Ginseng Camp, within a dipterocarp forest for ten days. Five mist nets were set around Camel Trophy for two days, in the heath forest and along the Camel Trophy River. Captured bats were placed in a cotton bag before being taken to the camp to be measured, weighed and preserved as zoological specimens if required.

Table 1. Trapping periods, number of traps and number of trapping nights at different sampling locations during the expedition.

Trapping period	Trap location	Total number of trap-nights
26 Feb.- 3 March	50 traps along Sabandar Rivers 3 mist nets and a harp trap set along Sabandar River	318
26 Feb.- 8 March	9 mist nets and a harp trap near Ginseng Camp	110
4 March – 8 March	50 traps at Ginseng Camp trails	250
8 March – 10 March	10 traps at Camel Trophy trails 5 mist nets	30
Total		708 trap-nights

Camera trapping

One camera trap was set at the bridge across Sabandar River, from 26 February until 1 March 2005. From 2 March to 8 March, the camera trap was set near the Ginseng Camp. At Camel Trophy Camp, the camera trap was set for two nights, from 8 March until 10 March 2005.

General Observations

Signs of mammals such as footprints, calls, claw marks on bark of trees, direct sightings or droppings of any animals were recorded. The following trails were surveyed: i) along the trail to Ginseng Camp from Agathis Camp, ii) from Ginseng Camp to Lobah Camp until the Maliau Falls, iii) along the trail from Ginseng Camp up to Camel Trophy Camp and iv) along the trail to Giluk Falls.

Species identification

Mammals and bats species identification were based on Payne *et al.* (1985) and Yasuma *et al.* (2005), respectively. All standard measurements were taken during identification.

RESULTS

Mammals recorded

A total of 18 species of mammals were recorded during the expedition using four different methods (Table 2).

Small Mammals Trapping

There were 25 individuals recorded during the expedition, comprising 13 species in three orders: *Scandentia*, *Rodentia* and *Chiroptera* (Table 3).

Primates

Two sightings of primates in the dipterocarp forest were observed: calls of Bornean gibbon (*Hylobates muelleri*) were heard daily in the early morning and an individual was seen in the forest near Ginseng Camp. In addition, a group of red leaf monkeys (*Presbytis rubicunda*) was seen along the trail to Lobah Camp within the dipterocarp forest (Table 3).

Archiodactyla

A few photographs of barking deer (*Muntiacus* sp.) were captured by the camera trap, and signs of wild pigs (*Sus barbatus*) were recorded along the trail to Camel Trophy Camp and Giluk Falls (Table 3).

Carnivora

The presence of sun bears (*Helarctos malayanus*) were recorded along the trail to Ginseng Camp, based on claw marks on tree barks. A couple of sun bears, possibly juvenile, were found foraging for food at the dumping hole located only 5 m away from the Ginseng Camp. Signs of disturbance were also recorded at SWD camp, near the Sabandar Falls about 10 m from the camp. The Malay civet, *Viverra*

Table 2. Number of species recorded by four different methods.

Methods	No. of individual	No. of species
Trapping	22	11
Mist netting	3	3
Camera trapping	-	5
General observation	-	4
TOTAL	25	18

Table 3. List of species trapped and observed in Maliau Basin Conservation Area during MBCA Scientific Expedition 2005.

Order	Species
SCANDENTIA(Tree shrew)	<i>Tupaia tana</i> <i>Tupaia longepis</i> <i>Tupaia gracili</i>
PRIMATES (Monkey)	<i>Hylobates muelleri</i> * <i>Presbytis rubicunda</i> *
RODENTIA (Rat, squirrel)	<i>Dremomys everettii</i> <i>Callociurus prevostii</i> * <i>Sundasciurus lowii</i> (CTC) <i>Sundasciurus tenuis</i> <i>Maxomys rajah</i> <i>Maxomys</i> sp. <i>Ratufa affinis</i> *
CHIROPTERA (Bats)	<i>Rhinolophus trifoliatus</i> <i>Rhinolophus borneensis</i> <i>Roussetus amphixicaudatus</i>
ARCHIODACTYLA (Ungulates)	<i>Muntiacus</i> sp. <i>Sus barbatus</i> *
CARNIVORA	<i>Helarctos malayanus</i> * <i>Viverra tangalunga</i>

Note : * Animals observed, CTC - Camel Trophy Camp

tangalunga, was captured at Camel Trophy Camp (Table 3).

DISCUSSION

The scientific expedition held in 1998 recorded three species of rodents. The number of species has increased to four species, as reported by Gasis *et al.* (1998) after 480 trap-nights during the 1996 expedition. From this study, seven species of rodents were recorded after 708 trap-nights. Additional to this, three species of tree shrew and bats were also recorded. After three expeditions, it appears that the trapping success from each expedition is equal, even though the last two surveys were done in a heath forest. External factors such as climaxed community, lack of food resources or heavy predation by predators (Gasis *et al.*, 1998)

possibly contributed to low diversity of small mammals in the heath forest. In this survey, lack of food resources and heavy predation were taken into consideration. Other than this, factors such as disturbance (noise) from construction works at Ginseng Camp and human presence in large numbers, may have also affected the numbers of animals detected.

For other larger mammals, only six species were recorded in this expedition. The sighting of primates was expected due to the number of calls heard during the trails survey, even though it was difficult to see them directly. As for wild pigs and barking deer, the reports were based on tracks and photographs taken during camera trapping. In this expedition, the research group was intrigued by the encounter with the sun bear and the Malay civet, at

Ginseng Camp and Camel Trophy Camp, respectively. Tracks of larger herbivores, such as Sumatran rhinoceros and Banteng were not seen in the dipterocarp forest or heath forest, as reported by Gasis *et al.* (1998) in the 1996 expedition. Elephant presence, as reported in the 1988 expedition, was nil.

CONCLUSION

Seven species of rodents, three species of tree shrew and three species of bats were recorded during the surveys. Zoological specimen of bats were taken, while for rodents and tree shrew, the individuals captured were tagged prior to release.

A couple of juvenile Sun bears (*Helarctos malayanus*) and a Malay civet (*Viverra zibetha*) have been encountered in this survey. For the primates, only two species, Bornean gibbon (*Hylobates muelleri*) and the red leaf monkey (*Presbytis rubicunda*), were seen during the general wildlife observations.

For the wild pigs, only tracks have been found along the trails, while for the ungulates, a barking deer (*Muntiacus* sp.) was recorded by camera trapping. There was no sighting of any other larger mammals such as elephant, Sumatran rhinoceros, Banteng or Sambar deer. Based on this survey, it was found that the diversity of mammals within Maliau Basin Conservation Area is low compared to those at the buffer zone.

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