Abundance of Primates in Ayer Hitam Forest, Puchong, Selangor

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ABSTRAK

Satu kajian tentang bilangan dan taburan primat telah dijalankan di Hutan Simpan Ayer Hitam, Puchong, Selangor (HSAH). Objektif utama kajian ini ialah untuk meneliti komposisi spesies dan densiti primat di dalam kawasan hutan tersebut. Sejumlah sembilan garisan transek telah dibina dan di sepanjang kajian setiap garisan dilalui sebanyak empat kali. Keseluruhannya sepanjang 34,080 meter telah dilalui. Densiti primat ditentukan melalui program DISTANCE V 2.2. Keputusan menunjukkan bahawa hanya lima spesies primat daripada sepuluh keseluruhannya yang berada di Semenanjung Malaysia telah direkodkan. Spesies yang telah direkodkan ialah Presbytis melalophos (Lotong Ceneka), P. obscura (Lotong Cengkong), Hylobates lar (Ungka Tangan Putih), Macaca nemestrina (Beruk) and M. fascicularis (Kera) dengan densiti masing-masing 0.21, 0.09, 0.08, 0.07 and 0.04 individu per hektar. Saiz kumpulan terbesar dipamerkan oleh P. melalophos (4.0 individu/ kumpulan) dan diikuti oleh M. fascicularis (2.6 individu/kumpulan), P. obscura (2.5 individu/kumpulan), H. lar (2.3 individu/kumpulan) dan M. nemestrina (1.6 individu/kumpulan). Densiti kumpulan bagi keseluruhan primat ialah 0.19 kumpulan/ha. Densiti dan saiz kumpulan primat di HSAH adalah dianggap rendah berbanding dengan kawasan lain di Semenanjung Malaysia. Aktiviti pemburuan haram dan pemburuan berlebihan oleh Orang Asli dan saiz hutan yang semakin kecil mungkin menyumbang kepada densiti primat yang rendah.

ABSTRACT

A study on the abundance and distribution of primates was conducted in Ayer Hitam Forest Reserve, Puchong, Selangor (AHFR). The main objective of this study was to examine the species composition and density of primates in the area. A total of nine transect lines were established and each line was walked four times during the study period. The total length of transect walked was 34,080 meters. The density was calculated using DISTANCE program V 2.2. The result showed that only five species of primates from a total of ten species present in Peninsular Malaysia were recorded. The species recorded were Presbytis melalophos (Banded-leaf Monkey), P. obscura (Dusky-leaf Monkey), Hylobates lar (White-handed Gibbon), Macaca nemestrina (Pig-tailed Macaque) and M. fascicularis (Long-tailed Macaque) with the densities of 0.21, 0.09, 0.08, 0.07 and 0.04 individuals per hectare, respectively. The largest group size was demonstrated by P. melalophos (4.0 individuals/group) followed by M. fascicularis (2.6 individuals/group), P. obscura (2.5 individuals/group), H. lar (2.3 individuals/group) and M. nemestrina (1.6 individuals/group). The group density of all primates was 0.19 groups/ha. The density and group size of primates in AHFR are relatively lower compared to other areas in Peninsular Malaysia. Illegal hunting and over hunting activities by the Orang Asli and the shrinking forest size may contribute to the low density of primates in AHFR.

INTRODUCTION

Vertebrate composition in tropical rain forest is complex and diverse (Harmelin-Vivien and Bourliere 1989). Some species are highly specialised to a particular microhabitat or microclimate and some are not so obvious. Any disturbance to the microhabitats and microclimates will severely affect the specialised species (Johns 1992, Zakaria and Nordin 1998). However, the degree of responses of vertebrates to the disturbance varies and it is difficult to assess the factors inducing the responses (Arshad and Zakaria 1999, Zakaria *et al.* 1999). Previous studies have shown that large disturbances can cause a reduction in numbers rather than a deletion in species (Gamar *et al.* 1999, Nordin and Zakaria 1997, Pimm 1979).

Disturbance to the natural forest has affected significantly to the population of primates. For example, the *M. fascicularis* showed a significant population increase in disturbed forest (Ibrahim 1995) and many other species show a significant population decrease after severe habitat disturbances (Johns 1992). The decline in population of various primate species, has generally altered the ecological balance of the biological community in Malaysia (Marsh *et al.* 1981).

It is recommended that wildlife management within Ayer Hitam Forest Reserve (AHFR) must be based upon information obtained on wildlife species composition and abundance. Unfortunately, there is no detailed information on primates that composed one of the major components of wildlife community. Information on primates is very crucial because they have been recognised as indicator species that may reflect the condition of the forest as wildlife habitats (Johns 1992). Furthermore, information on wildlife population is necessary in order to be able to undertake sound management action.

This study will provide detailed information on the composition and density of primates in AHFR. It is hoped that the knowledge obtained can be used in formulating wildlife management strategies in the area.

STUDY AREA AND METHODOLOGY

The study was conducted in Ayer Hitam Forest Reserve, Puchong, Selangor Darul Ehsan. The area is located at about 3°00.00'N to 3°02.20'N and 101°37.90'E to 101°40.00'E, approximately 20 kilometers southwest of Kuala Lumpur. The forest is about 1,248 hectares in size and was selectively logged about 20 years ago.

The study was started in September and completed in December 1998. The Distance Sampling Method (Buckland *et al.* 1993, Burnham and Anderson 1984) for line transects (Burnham *et al.* 1981) was chosen for this study. The line transect is suitable for large rain forest area such as AHFR. It can be utilised to compare the density of different species of primates.

Nine transect lines were established in AHFR to represent the whole area of the forest. Plastic tags were placed at every twenty meter intervals to enable us to mark the animals location. The length of each transect line varied from 640 to 1,200 meters according to the topography condition. The surveys were conducted between 0715 and 0730 hours. Since primates are inactive at about midday, the surveys were designed to be completed by 1200 hours (Marsh 1981). Each line was surveyed four times with the walking speed of 500 meters per hour which lasted for two to four hours depending on the length of the transect. The total distance walked on the transects was 34,080 meters. In order to reduce bias on primates detection, the surveys were stopped when the weather became cloudy or when it was raining.

Analysis of Data

The density of primates was analysed using DISTANCE program (Buckland *et al.* 1993) based on the following principle:

$$D = n \ / \ 2L\int_0^w g(x) \ dx$$

Where, n = no. of individuals
L = Total length of transect
g(x) = probability of detection of primate at line
w = perpendicular distance

RESULTS

Species Composition

A total of five primate species were observed in AHFR. The species were *Presbytis melalophos* (Banded-leaf Monkey), *P. obscura* (Dusky-leaf Monkey), *Hylobates lar* (White-handed Gibbon), *Macaca fascicularis* (Long-tailed Macaque) and *M. nemestrina* (Pig-tailed Macaque).

Abundance

Altogether 101 observations of primates were recorded during the study period. A total of 40 observations were obtained for *P. melalophos* , 25

for *H. lar*, 15 for *P. obscura*, 13 for *M. fascicularis* and 8 for *M. nemestrina* (Table 1). The species *P. melalophos* showed the highest values for the density of individuals (0.21 animals/hectare) and groups (0.05 groups/hectare). The *M. fascicularis* indicated the lowest density of individuals and groups (0.04 and 0.03 per hectare, respectively). The density of *H. lar* was 0.08 individuals per hectare and 0.03 groups per hectare, *P. obscura* was 0.09 individuals/hectare and 0.04 groups/ hectare and *M. nemestrina* was 0.07 individuals/ hectare and 0.04 groups/hectare (Table 2).

The average group size of primates (average number of individuals/group) was 2.7 animals. Among the species *P. melalophos* showed the largest group size (4.0 individuals/group), followed by *M. fascicularis* (2.6 individuals/ group), *P. obscura* (2.5 individuals/group), *H. lar* (2.3 individuals/group) and *M. nemestrina* (1.6 individuals/group).

DISCUSSION

Species Composition

There were only 5 species of primates from a total of ten present in Peninsular Malaysia were recorded by Distance Sampling method in Ayer

Hitam Forest Reserve. The species that were not observed were *M. arctoides* (Stumped-tailed Macaque), *H. syndactylus* (Siamang), *H. agilis* (Black-handed Gibbon), *P. cristata* (Silvered-leaf Monkey) and *Nycticebus coucang* (Slow loris). Out of these five, *N. coucang* is known to occur in the area since it has been trapped many times previously. Sundai (1996) reported that this species was trapped in a small mammal trap and was released back to the forest. Furthermore, this species was a nocturnal animal and the chance to observe this species during the study was very low.

Other species were known to occur only at specific habitats and locations in Peninsular (Khan 1992, Chivers 1974, Lekagul 1974, Medway 1969). For example, the *H. syndactylus* is more restricted to the main range of the penin-sular, from the northern parts to the north of Selangor. Moreover, the *H. agilis* was restricted between the forest of Perak and Muda rivers. On the other hand, *P. cristata* was observed only at coastal area especially at the West Coast of Pe-ninsular Malaysia. Therefore, AHFR does con-tain all species of primates that were supposed to occur within their normal range.

TABLE 1
Number of observations of primates in Ayer Hitam Forest Reserve

No.	Species	No. of times observed in group	Total no. of individuals in the groups	No. of times observed in single individual	Total no. of individuals observed
1.	*Presbytis melalophos*	11	40	0	40
2.	*Hylobates lar*	11	25	0	25
3.	*Presbytis obscura*	3	13	2	15
4.	*Macaca fascicularis*	5	13	0	13
5.	*Macaca nemestrina*	4	7	1	8
	Total				101

TABLE 2
The individual and group density of primates in Ayer Hitam Forest Reserve

No.	Species	Density	
		Individuals/ha	Group/ha)
1.	*Presbytis melalophos*	0.21 ± 0.42	0.05 ± 0.02
2.	*Hylobates lar*	0.08 ± 0.20	0.03 ± 0.03
3.	*Presbytis obscura*	0.09 ± 0.56	0.04 ± 0.02
4.	*Macaca fascicularis*	0.04 ± 0.02	0.03 ± 0.01
5.	*Macaca nemestrina*	0.07 ± 0.60	0.04 ± 0.01
	Total Density	0.49 ± 0.22	0.34 ± 0.02

Species Abundance

The density of primates at AHFR during the study was relatively low compared to other studies in the Peninsular. For example, the estimated mean group density of primates in the primary lowland forest at Krau Game Reserve was 1.35 groups/hectare (Marsh 1981). That includes 0.60 groups/hectare for *P. melalophos*, 0.38 groups/hectare for *P. obscura* and 0.28 groups/hectare for *Hylobates* spp. compared to only 0.05, 0.04 and 0.03 (*H. lar* only) groups/hectare respectively at AHFR. In the same study, the individual density (all species) was 3.96 animals/hectare in primary forest and 3.17 individuals/hectare in five-year old logged area, while at AHFR was only 0.49 individuals/hectare. The same author reported that at Sungai Depak in Kelantan and Kota Tinggi, Johor the density was 1.47 and 3.07 animals/hectare.

It is well known that the *M. fascicularis* was the most common species in many disturbed areas and secondary forests in Peninsular Malaysia (Loong 1980, Mah 1980). For instance, the density recorded at Kuala Rompin, Pahang was 3.09 individuals/ha in primary forest and 1.07 individuals/ha in logged forest (Marsh 1981). According to Yuop (1998) the density of *M. fascicularis* at the Campus of University Malaya, Kuala Lumpur was 0.6 individuals/hectare and in Kuala Lumpur was 3.03 individuals/hectare (considering only the green area at Kuala Lumpur). However, at AHFR there was only 0.04 individuals/hectare of *M. fascicularis*.

The main cause for the lower density of primates in AHFR was probably due largely to illegal hunting. The forest is surrounded by human inhabitants and is not fenced. It is also not strictly monitored and people can easily enter from several entry points. Moreover, there is an Orang Asli settlement adjacent to the forest reserve. According to Marsh (1981), the primates were traditionally hunt by most of the Orang Asli and in AHFR the hunting activity was probably very high. In addition, the behaviour nature of *Macaca* species which is not that wild, made it an easy target for hunters. They hunt primates as their sources of protein. A few illegal traps of wildlife were found during the study. According to the DWNP, one Chinese Restaurant at Puchong has been identified to sell the wildlife meat and it was thought that the Orang Asli's might act as its supplier. However, there is no documented proof to show that they were responsible for the decreasing number of primates in Ayer Hitam Forest Reserve.

The lower density of primates in the area may be also due to the condition of the forest itself. Although the reserve is only 1248ha, the forested area was originally about ten times bigger. Unfortunately, the forested area is shrinking at a very rapid rate and eventually only the allocated reserve will remain intact due to the surrounding development activities. Thus, it is expected that a small pocket of forest will contain a small number of primates. Since these primates are social animals, other factors such as minimum home range size, minimum group size for population viability and quality of habitats may also affect the population size. More detailed study is needed to examine these factors.

CONCLUSIONS

It is recommended that any future planning or development within AHFR should take into consideration the existing wildlife population in the area. The forest reserve should be gazetted as a protected area such as wildlife reserve to ensure the continued existence of wildlife species and to protect wildlife habitats in the area.

Illegal hunting of wildlife by Orang Asli in the area was one of the main factors contributing to the decline of wildlife population. In order to protect and conserve the remaining wildlife population, the relevant agencies (UPM, Forestry Department and DWNP) should initiate awareness programme for the local people nearby, and at the same time provide alternative source of income to reduce their dependency on wildlife as main food.

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