

**A PRELIMINARY ANALYSIS ON LARGE MAMMALS  
DISTRIBUTION PATTERNS AND HABITATS IN JOHORE  
FROM 1992-1998**

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**Abstract**

A preliminary analysis was conducted on large mammals data accumulated from the state of Johore between 1992 to 1998. The objectives of the analysis were to determine the distribution trend and pattern and to identify important habitats for selected wildlife species during the above period. The analysis showed that four habitats namely hill dipterocarp, beach forest, lowland forest, and oil palm plantation recorded the highest number of mammal observations compared to other habitat types identified in the states. *Hylobates lar* (f=262), *Sus scrofa* (f=211), *Elephas maximus* (f=208) and *Tapirus indicus*(f=129) were some of the common mammals in the state during the above period. The distributions of mammals were mainly concentrated in three districts in the state i.e. Segamat (47.99%), Mersing (17.48%) and Kota Tinggi (15.26%) respectively. This is due to the remaining forest in these districts thus providing habitat to most of the large mammals. The analysis showed the existing habitats are crucial to support the wildlife species especially large mammals. There is a need to establish corridor between large tracts of forests to enable large wildlife species to migrate to other forests in search of food and shelter.

**Abstrak**

Satu analisa awalan ke atas data-data mamalia besar yang dikumpul daripada negeri Johor dari tahun 1992 hingga 1998 telah dijalankan bagi memperolehi corak /trend taburan serta mengenalpasti habitat penting bagi spesies-spesies tertentu. Berdasarkan kepada analisa yang dijalankan di dapati bahawa terdapat empat habitat utama yang merekodkan jumlah pemerhatian mamalia yang tinggi iaitu bukit dipterokarp, hutan pantai, hutan tanah pamah, dan ladang kelapa sawit. Antara mamalia utama yang direkodkan di negeri ini dalam jangka masa kajian ialah *Hylobates lar* (f=262), *Sus scrofa* (f=211), *Elephas maximus* (f=208) dan *Tapirus indicus*(f=129). Taburan mamalia juga adalah tertumpu di beberapa daerah seperti Segamat (47.99%), Mersing (17.48%) dan Kota Tinggi (15.26%). Ini adalah disebabkan oleh masih terdapatnya kawasan hutan yang menyediakan habitat bagi kebanyakan mamalia besar di dalam daerah ini.

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## **Introduction**

Wildlife distribution records in the past were mainly based on reports submitted by rangers in various formats and styles. As a result, there is no standardized format of reporting and this made it difficult for the Department to carry out a thorough analysis on the status and distribution of wildlife species. Beginning 1992, a wildlife database was set up in the Department to facilitate the collection and dissemination of wildlife information for management purposes. A standard format of recording wildlife data was adopted and used in all the states. The new format includes additional data such as location and grid references of individual observation. This enabled the Department to generate the annual wildlife database report which was used by the state wildlife offices in managing wildlife related issues particularly in assessing the Environmental Impact Assessment (EIA) reports.

With the introduction of Geographic Information System (GIS) in the Department, these wildlife data were presented in distribution maps instead of the usual table form. The map includes both spatial and geographical information of the species. Location of individual observation can be plotted based on the grid references in the topographic map used during the survey. The use of Global Positioning System (GPS) further enhances data collection by providing a more accurate location of wildlife observations made in the field. Following this, the distribution of several key wildlife species like the Sumatran rhinoceros, elephants, tigers and sambar deer were plotted on maps and used in monitoring the population trend and status.

## **Methodology**

Wildlife data were collected from the DWNP state offices on monthly basis using a standard format. These data were based on the observations made by the Department's staff during their routine work in the districts in the respective states. Apart from that, wildlife data were also gathered from wildlife inventories conducted by the Department in the wildlife reserves throughout the peninsula. The data were then compiled using Dbase III plus and maintained by the Management Information System Division in the Department's wildlife database. Data from the state of Johore between 1992-1998 were extracted for this preliminary analysis. Analysis on wildlife distribution was conducted using Arcview 3.1. Distribution of selected wildlife species in the state was plotted on maps using Arcview 3.1. Forest type and land use maps (Dept. of Agriculture, 1990) was used as the base maps for plotting the distribution of selected wildlife species in the state.

## **Results and Discussions**

A total of 4166 wildlife observations were made in Johore between 1992-98. Of these, 1323 observations on large mammals were recorded during the above period.

*Hylobates lar* was the most common species recorded (f=262), followed by *Sus scrofa* (f=211), *Elephas maximus* (f=208), and *Tapirus indicus* (f=129) (Table 1). *Hylobates lar* was also recorded in most habitat types (14), and was followed by *Macaca fascicularis* (13), *Elephas maximus* (13), and *Paradoxurus hermaphroditus* (12) (Table 2). Only seven occurrences of the *Dicerorhinus sumatraensis* were recorded during the period. The *Dicerorhinus sumatraensis* and *Helarctus malayanus* were the two least recorded species with only 7 and 9 records respectively.

The analysis also showed four habitats; namely Hill Dipterocarp (BD)(27.7%), Beach forest (HP), oil palm plantation (KS)(14.9%) and lowland Dipterocarp (PD)(25.5%) recorded most of the wildlife species in the list. *Sus scrofa*, *Dicerorhinus sumatranensis*, *Tapirus indicus*, *Muntiacus muntjak*, *Hylobates lar* and *Cervus unicolor* were mostly recorded in hill dipterocarp forest while *Muntiacus muntjak*, *Manis javanica*, *Macaca fascicularis*, and *Macaca nemestrina* were common in lowland dipterocarp. *Sus scrofa*, *Elephas maximus*, *Prionailurus planiceps*, and *Paradoxurus hermaphroditus* were also commonly recorded in oil palm plantation.

The distribution of wildlife in the state is more prominent in three districts namely Segamat (47.99%), Mersing (17.48%), and Kota Tinggi (15.26%) compared to other districts. Johor Bahru, Batu Pahat, and Pontian on the other hand, recorded the least number of wildlife observations in the state. Kota Tinggi, Kluang, Mersing, and Segamat recorded a high frequency of *Elephas maximus*. The frequency of *Tapirus indicus* is notably high in Segamat (65.9%) and Mersing (20.2%) respectively.

The general distribution pattern of the above wildlife species when plotted on a map revealed that the remaining forested areas in the state are important wildlife habitat especially for large mammals. Currently, remaining forest areas are located in Segamat, three districts compared to other districts. Four wildlife reserves, Endau Kota Tinggi Wildlife Reserve, Endau Rompin State Park, Endau Kota Tinggi Wildlife Reserve, and Endau Keluang Wildlife Reserve are located in these districts and they made up the majority of the forested area in the state. The total forested area in the state is 484,053 ha or 25% of the total land area in the state (EPU 1994). Wildlife reserve and national parks made up only 10% of the forested area while state land and permanent forest reserve made up the rest. On the other hand, a total of 136,432 ha of forest were degazetted in the state between 1978-1994. 63.35% of the degazettement were for agricultural purposes followed by state park (35.8%), township (0.05%) and others (Forest Dept. 1994).

Johor Bahru, Batu Pahat and Pontian registered very low number of mammal observation due to the limited forest cover in these districts. Majority of the forests in these districts has been converted into plantation and other forms of land use. Most development activities in the state also take place along the west coast and this contributed to the decline in the size of forest along the west coast. This situation is reflected in the wildlife distribution map generated during this study. For

est cover is limited to the eastern part of the state up to the Pahang border where the Endau Rompin State Park is situated. The distribution of mammals such as elephants and wild pigs are centered around agricultural areas especially oil palm plantations. 47% of elephant observations were recorded in oil palm plantation compared to other habitat types. Elephant damages are quite rampant in Johore especially in Kota Tinggi and Kluang. Currently a total of 17 elephants had been captured and translocated from the affected agriculture plantations in both districts.

Mammal species were also recorded in areas adjacent to forest islands in the state. These forest islands provide shelter to most of the wildlife species while the plantations surrounding them provide most of the food requirements. The dependency of wildlife on food source from the surrounding plantation areas has led to the conflicts between wildlife and human. Apart from elephants, other wildlife species such as monkey, wild pigs, and silvered-leaf monkey also contribute to the above conflicts. Several wildlife species are found more in urban areas compared to forest in Muar and Johore Bahru.

### **Conclusion**

Forested areas in the state are important wildlife habitat. The presence of wildlife reserves on the east coast of Johore accounted for majority of the wildlife observations between 1992-98. Wildlife conflicts mostly occurred in areas where forest islands are surrounded by agriculture plantations. Important natural habitats like the lowland and hill dipterocarp forests must be preserved to ensure that sufficient habitats are available for wildlife species. Therefore, it is important that these areas are protected against any forms of human intrusion.

### **Literature Cited**

Department of Agriculture 1990: Land use map scale 1:50 000.

EPU (1994) in Assesment of Biological Diversity in Malaysia. Ministry of Science, Technology and the Environment, Malaysia.

Forest Dept. (1994) in Assesment of Biological Diversity in Malaysia. Ministry of Science, Technology and the Enviroment, Malaysia.

Frequency of wildlife observations in districts

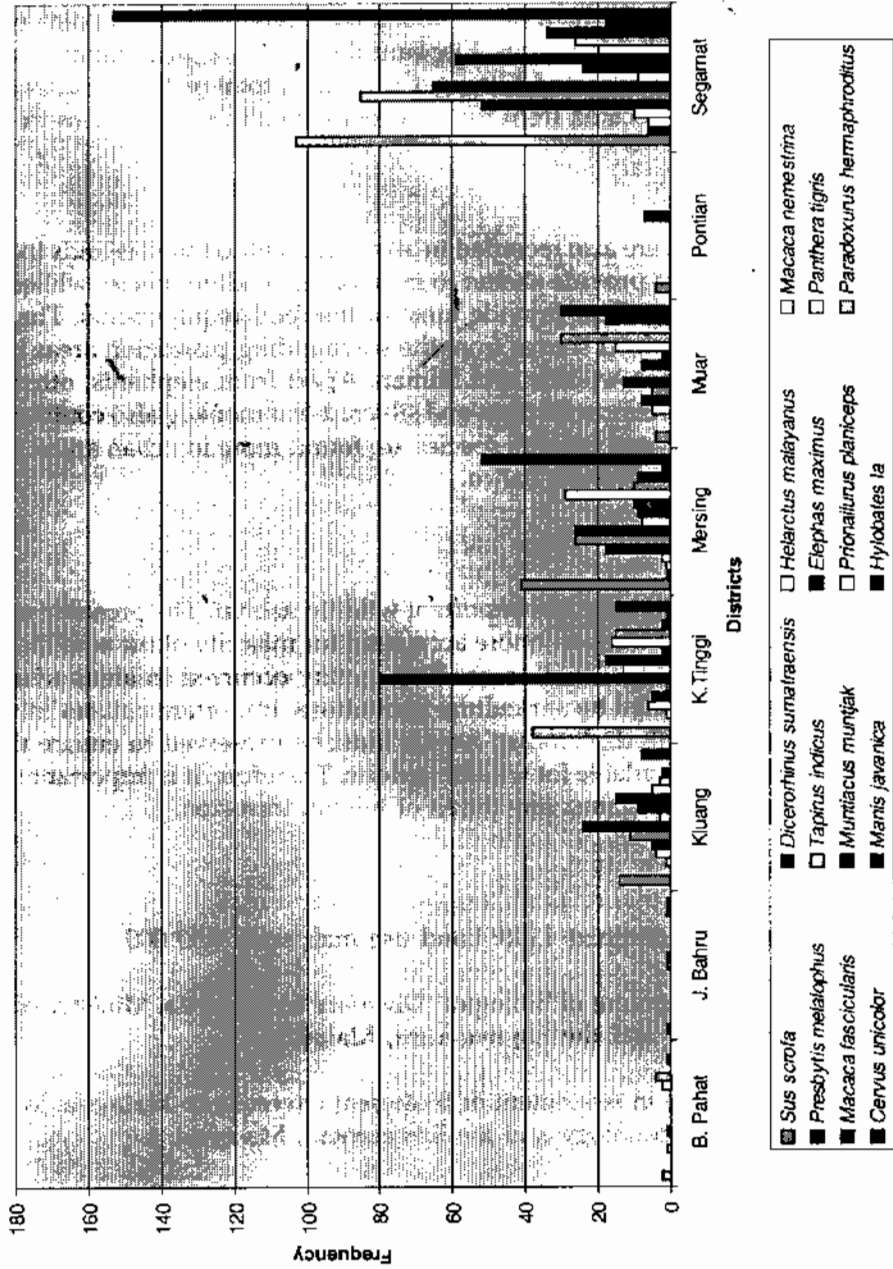


Table 1. Frequency of Large Mammals Recorded in Johore 1992-98

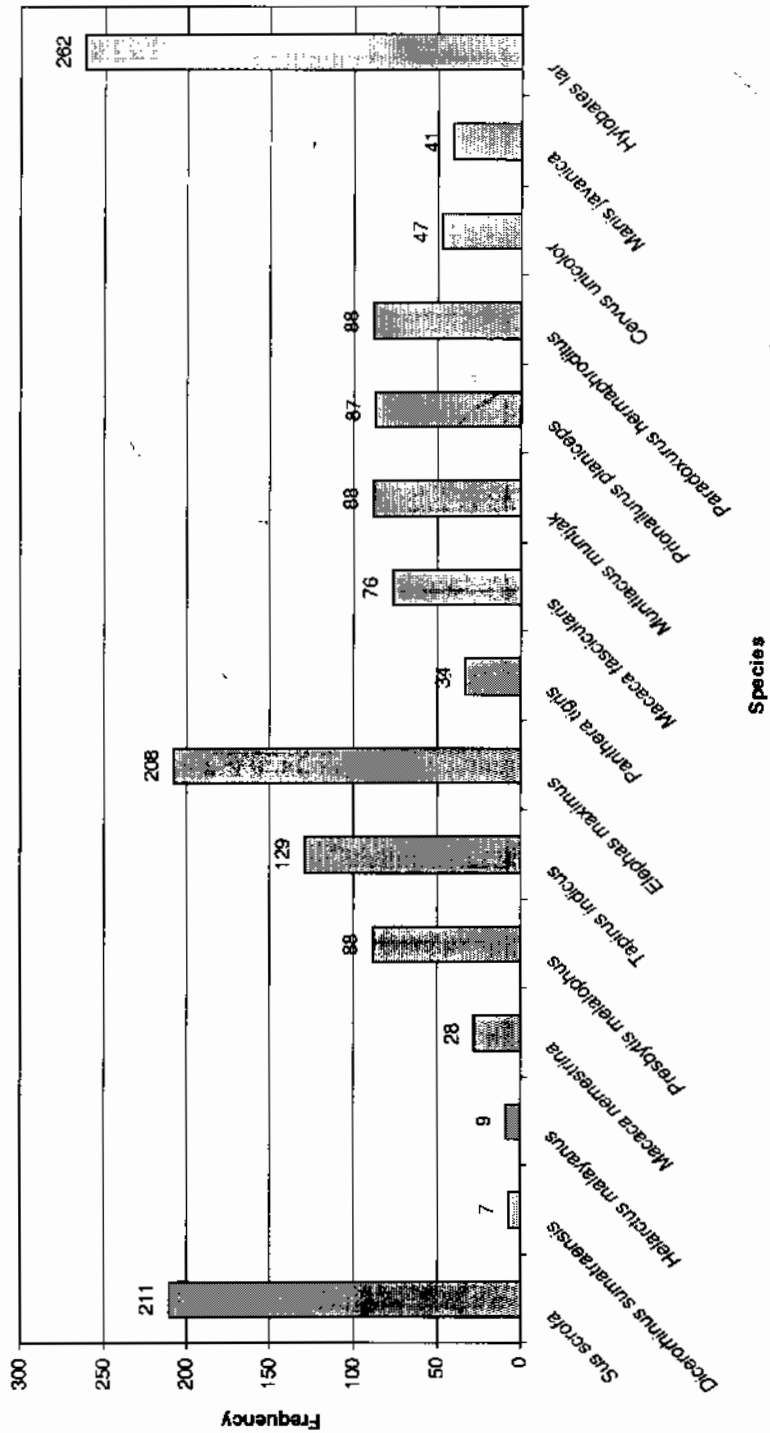


Table 2. Distribution of Selected Wildlife Species According to Habitat

Wildlife Species	Frequency recorded in habitat																	TOTAL	MAX											
	Habitat Type																													
	HB	KS	HK	BD	HP	LH	PD	P	DB	HR	TL	HT	K	KG	LG	B	G	HTL	S	HG	HY	PL	SS	T	TA	LK	PT	TP		
<i>Sus scrofa</i>	12	25	19	82	13	11	56																						198	62
<i>Dicotyles sumatranensis</i>				5			2																						7	5
<i>Helarctos malayanus</i>			1	3	1	1	2																						9	9
<i>Nocca renesstria</i>	3	6	1	1	2	1	5	5													1						1	28	6	
<i>Presbytis melaloprus</i>	1	3	10	27	9		28	1			1	1									1							84	28	
<i>Tapirus indicus</i>	1	1	8	85	1	1	38			2	1	4																123	85	
<i>Elephas maximus</i>	1	65	9	43	1		26	6	2	1	1	1	1															158	65	
<i>Panthera tigris</i>	4	4		12	1	1	8			1						2	1											34	12	
<i>Nocca fascicularis</i>	12	11	5	1	8		24	1									2	2	1	2	1	1						71	24	
<i>Muntiacus muntjak</i>			8	32	7	33					1	1								3	1							86	33	
<i>Pronalurus planiceps</i>	1	45		4	4		18	2												1	2							82	45	
<i>Paradoxurus hermaphrodus</i>	10	29	4	5	2		21	10													2		1		2	1		88	29	
<i>Cervus unicolor</i>	1			18	12		7	1			3									2								45	18	
<i>Mepus javanicus</i>			8	2	3		8	14																				49	14	
<i>Hylobates lar</i>	6		45	87	34		62	1			1	9					1			1	2	9						261	87	
TOTAL	52	197	111	367	98	15	338	41	2	5	8	18	1	1	7	1	7	2	8	5	16	9	1	4	4	2	1	2	1323	367
Max	12	65	45	87	34	11	62	14	2	2	3	9	1	1	3	1	2	2	3	2	9	8	1	2	1	1	1	2		
Percent of total	3.93	14.9	8.39	27.7	7.41	1.13	25.5	3.1	0.15	0.38	0.6	1.36	0.08	0.08	0.53	0.08	0.53	0.15	0.8	0.36	1.21	0.68	0.08	0.3	0.3	0.15	0.08	0.15	100	

Table 3. Number of Observations of Selected Wildlife Species in Districts

Local name	Scientific name	No. of Observations in District										TOTAL
		B. Pahat	J. Bahru	Kluang	K. Tinggi	Mersing	Muar	Pontian	Segama	TOTAL		
Babi hutan	<i>Sus scrofa</i>	2	1	14	38	41	4	4	103	207		
Badak kerbau	<i>Dicerorhinus sumatraensi</i>					1			6	7		
Beruang	<i>Helarctus malayanu</i>			1	1	1			6	9		
Beruk	<i>Macaca nemestrina</i>	1		4	6	2	5		10	28		
Ceneka	<i>Presbytis melalophus</i>			5	5	18	8		52	88		
Cipan	<i>Tapirus indicus</i>	1		11	1	26	5		85	129		
Gajah	<i>Elephas maximu</i>			24	80	26	13		65	208		
Harimau belang	<i>Panthera tigris</i>		1	3	13	8			9	34		
Kera	<i>Macaca fascicularis</i>		1	9	18	9	8	7	24	76		
Kijang	<i>Muntiacus muntja</i>			15	2	10	2		59	88		
Kucing batu	<i>Prionailurus planiceps</i>	2		5	16	29	15		20	87		
Musang pulut	<i>Paradoxurus hermaphroditus</i>	4		3	15	10	30		26	88		
Rusa	<i>Cervus unicolor</i>			2	2	9			34	47		
Tenggiling	<i>Manis javanica</i>	1	1		1	2	18		18	41		
Ungka tangan putih	<i>Hylobates lar</i>		1	8	15	52	30		153	259		
	TOTAL	11	5	104	213	244	138	11	670	1396		
	Percentage	0.79	0.36	7.45	15.26	17.48	9.89	0.79	47.99	100		



Frequency of Observations of Selected Mammals from 1992-98

