

# REVIEW OF SUMATRAN RHINOCEROS (*Dicerorhinus Sumatrensis*) POPULATION IN PENINSULAR MALAYSIA

By  
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## ABSTRACT

*The first comprehensive review of Sumatran rhinoceros population in Peninsular Malaysia was made in 1984. Since then, population estimates were made on an ad hoc basis. In 1995, an effort was made to estimate the current population based on the more intensive and systematic surveys. In general, the population of Sumatran rhinoceros in Peninsular Malaysia was observed to decline at an alarming rate. Factors that attributed to the decline included habitat loss, poaching and displacement of the rhinos into other forest reserves. Further surveys are necessary to provide an accurate population estimate for the country. However, it was strongly emphasized that the present known population should be provided with the maximum protection from habitat degradation and poaching. It was also recommended that the number of rhino protection units be increased and trained as permanent staff; increase protection of sensitive areas; increase surveys to include all forest reserves and the Main Range; capacity building; initiation of GEF Phase II with inclusion of fund raising programmes; accelerate village outreach projects; collaborative effort with the Department of Forestry on saving the species and establish captive breeding nucleus within a fenced up game reserves in Krau and Sungai Dusun. The situation with the Sumatran rhinoceros in Malaysia demands a comprehensive multifaceted conservation strategy to ascertain a sustainable population growth. The key population requires immediate protection from poachers, habitat encroachment and degradation.*

## ABSTRAK

*Kajian yang komprehensif keatas populasi badak sumatra di Semenanjung Malaysia telah dijalankan pada tahun 1984. Semenjak itu, anggaran populasi badak sumatra dijalankan secara ad hoc. Pada tahun 1995, satu usaha dijalankan untuk menganggar populasi spesies ini secara bancian intensif. Pada amnya, populasi badak sumatra di Semenanjung Malaysia adalah menurun pada kadar yang tinggi disebabkan faktor-faktor seperti kehilangan habitat, pemburuan dan pemindahan badak-badak ke rezab atau kawasan lain. Bancian tambahan adalah perlu untuk mendapatkan anggaran yang lebih*

*tepat. Populasi badak yang diketahui perlu diberi perlindungan sepenuhnya dari pemburuan dan pemusnahan habitat. Adalah juga dicadangkan bilangan unit kawalan badak ditambahkan dan dilatih sebagai kakitangan tetap, menambahkan kawalan di kawasan yang sensitif, menambahkan banciaan untuk memasukkan semua rezab hutan dan Banjaran Titiwangsa, penambahan kapasiti jabatan, memulakan Fasa II GEF serta memasukkan Program "Fund Raising", mencepatkan program pengembangan ke perkampungan, bekerjasama dengan Jabatan Perhutanan untuk menyelamatkan spesies dan penubuhan pusat pembiakan dalam kurungan di Rezab Krau dan Sg. Dusun. Situasi di Malaysia memaksa strategi yang komprehensif untuk memastikan pertambahan populasi yang berpanjangan. Populasi utama memerlukan kawalan serta merta daripada pemburuan, pencerobohan dan pemusnahan habitat.*

## INTRODUCTION

Estimates of Sumatran rhinoceros population in Malaya were first reported in 1961 with a total of 50 individuals distributed over seven states (Metcalf, 1961). Corresponding population estimates were obtained for 1966, 1968 and 1973 with populations of 10 - 30, 20 and 18 - 22 respectively (Hislop, 1966; Stevens, 1968 and Ng Poh Tip, 1973). Since then, more updates on the population have been carried out in Malaysia between 1979 and 1995 (Tajuddin, M., Khan, 1984; 1982, 1987, 1989; Anon. 1993, Zainal-Zahari et al., 1995).

All of these surveys have been conducted randomly, depending on the strength of manpower and financial support. None of them completely cover the areas demarcated and only provided a representative estimate. In the recent surveys, approximations were based on the density in a particular area and extrapolated for the whole reserve as practiced by Flynn and Tajuddin, 1984. The rhino population estimates for 1982 (Table 1), were taken from the survey carried out by Flynn and Tajuddin between 1975 and 1981. The estimated number of Sumatran rhinoceros for Peninsular Malaysia in 1995 has reduced by 60% since 1993. This factor must be taken seriously despite acknowledging the fact that the survey was incomplete. Other factors include poaching, encroachment into parks and reserves and habitat degradation. Recently, the areas of Bintang Hijau and Belum have been opened up for logging (The Straits Times, 23 November, 1995). Migration of rhinos into the main range could occur due to the pressure on their prime habitat. Similar incidence have been observed in Banteng (*Bos javanicus*) in Thailand.

This review of population estimates was necessary to provide an insight into

the population trend of Sumatran rhinoceros in Peninsular Malaysia from 1979-1995. The main areas discussed are Taman Negara, Endau Rompin, Belum and Selama. The other areas with previous or present population estimates are also discussed. (Fig. 1).

Figure 1. Sumatran rhinoceros population in Peninsular Malaysia (1995)

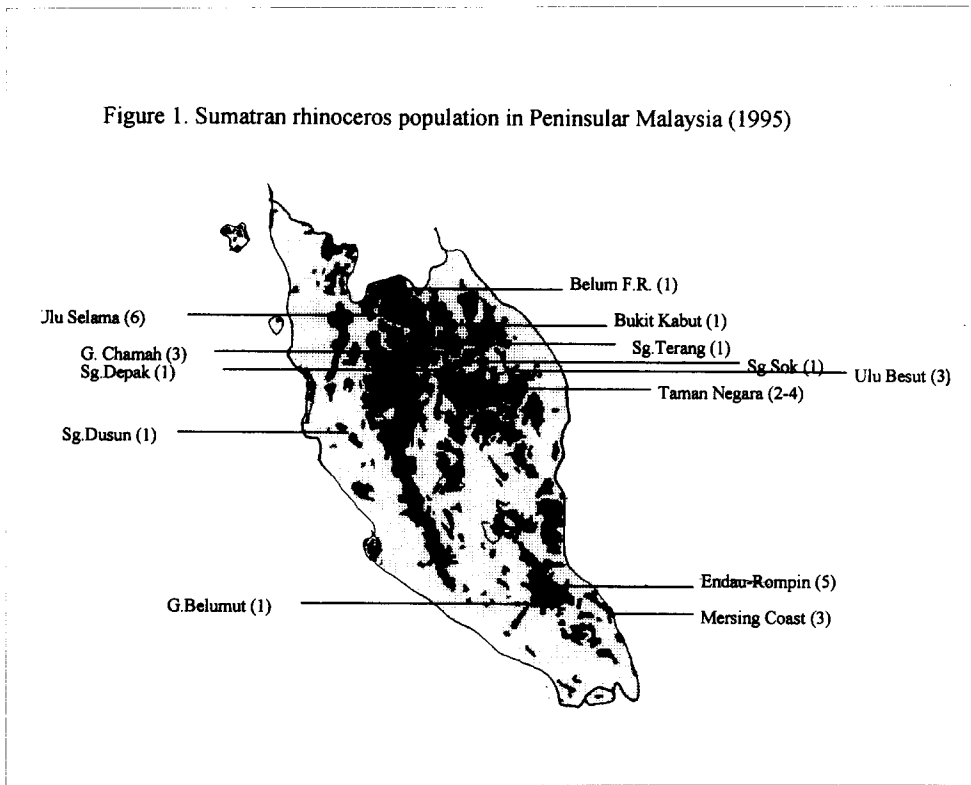
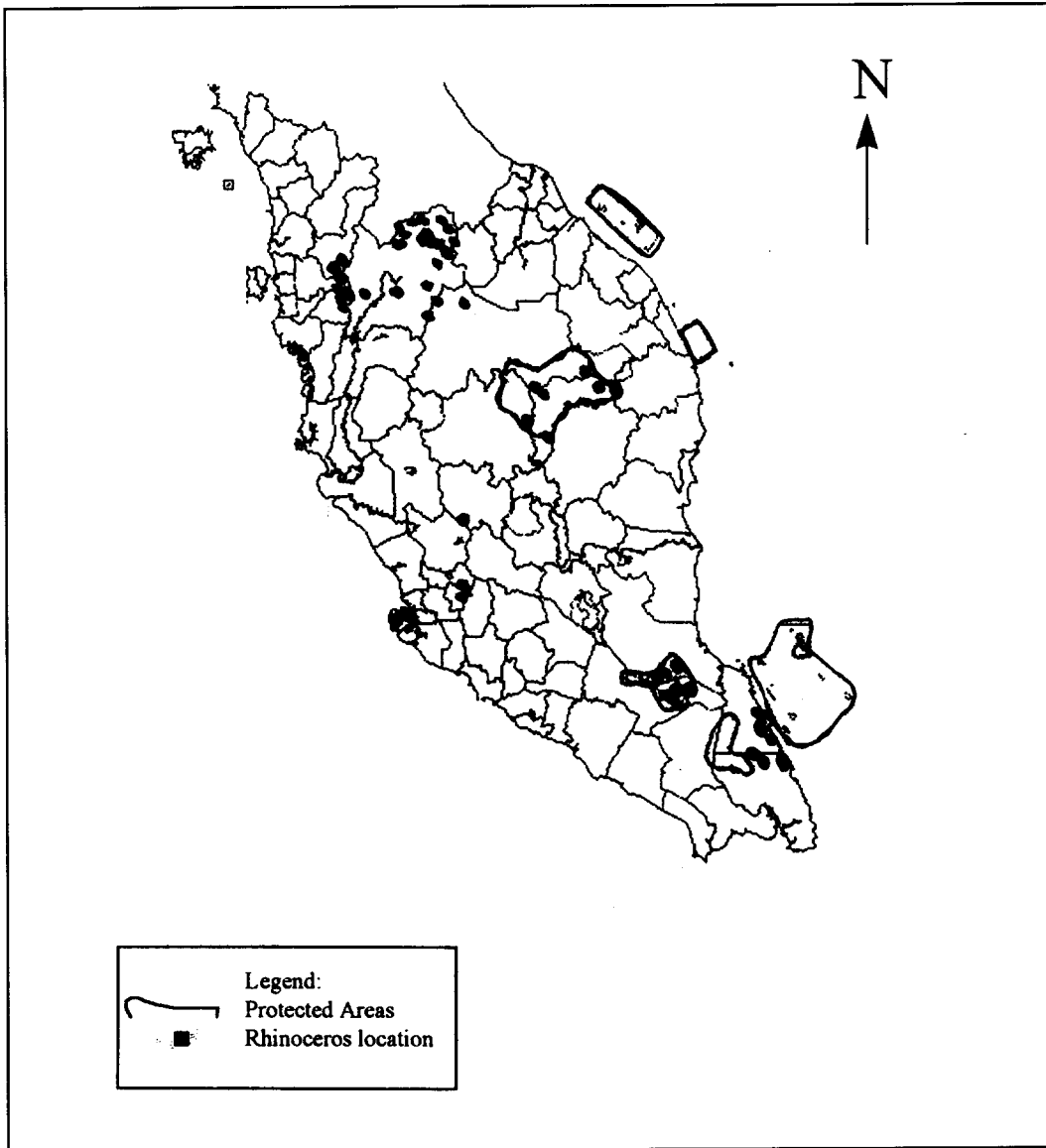


Figure 1: Present Distribution of Sumatran rhinoceros in Peninsular Malaysia.

Distribution of Sumatran rhino (1995 survey)



Note: Distribution based on partial survey conducted in 1995

## POPULATION ESTIMATES:

### Southern Region

#### Endau-Rompin area

A survey conducted by Flynn and Tajuddin from 1975-1981, (1984) gave an estimate of 20 - 25 animals for Endau Rompin. Ten animals were counted from tracks in an area of 400km<sup>2</sup> (1 animal per 40km<sup>2</sup>). During the survey, tracks of at least three young rhinos were recorded indicating that the population is still reproducing, but at an extremely low rate of 0.5 young per year (Flynn and Tajuddin, 1984). It was reported that rhino tracks were consistently found in various areas including the upper Pukin and Kemapan basins. The survey of 1992 showed a marked reduction in rhino numbers and an increase in encroachment by "Orang asli", rattan collectors and poachers (67% of total area surveyed had been encroached). The areas around Sungai Endau and Sungai Kemapan were utilized as an army training ground and evidence of explosives were seen. In addition to these areas, bullet casings were also discovered in Sungai Jemai and Sungai Semerong (22% of total area surveyed). The use of snares was pronounced in three of the areas surveyed (33% of total area surveyed). Logging and dam construction (272 ha) activities were present in and around Sungai Kemidak. Old signs of faeces, wallows and feeding were reported, along with an old track (Burhannuddin et al., 1995). There was no recent evidence of habitat use by rhinos observed during these surveys.

In the 1995 survey covering more than 70% of the area, a total of five rhinos were identified based on tracks. No indication of young rhinos were observed and the areas of Pukin and Kemapan showed no evidence of rhinos at all. A lower population estimate than previous surveys is expected due to the occurrence of poaching, human encroachment and the absence or very low reproduction rate. It was evident that between 1985 and 1989, at least seven rhinos were poached in Johor. The total area surveyed was 456 km<sup>2</sup>. Based on the five rhinos identified, a density of one animal per 91 km<sup>2</sup> was presumed. During the surveys conducted by Flynn and Tajuddin (1984), these localities had a density of one animal per 40km<sup>2</sup> and were considered a high density area. However, in the other remaining areas surveyed, no rhinos were found. This is in contrast to a density of one animal per 80 - 120km<sup>2</sup> reported by Flynn and Tajuddin (1984).

In Johor, rhinos were also observed to occur in Gunung Belumut (1), Tenggaroh Forest Reserve (1) and Sungai Ara-Ulu Sedeli (1). The population indicated a marked decline in rhino numbers over the past decade. The Jemaluang Forest Reserve had 1 - 3 rhinos in the 1980's but recent surveys showed no signs of the species. In 1994, a young male Sumatran rhino was captured from Sungai Ara-Ulu Sedeli and transferred to the Sungai Dusun Rhino Conservation Centre.

## NORTH CENTRAL REGION

### Taman Negara

In 1975, R. Oliver encountered tracks of an estimated 3 - 5 rhinos in the upper Atok River Basin. A mid-1976 survey confirmed at least one rhino in the same region although the habitat showed little evidence of use. A survey in 1980 showed no evidence of rhino in the lower Atok valley. According to Flynn and Tajuddin (1984), an estimated 8 - 12 rhinos were present in Taman Negara mainly in the upper Atok and Sepia river areas. Tracks of young rhinos have never been recorded in Taman Negara, indicating an extremely low recruitment rate (Flynn and Tajuddin, 1984). An estimate of 22 - 36 animals were seen in published reports by M. Khan in 1987, 1989 and 1993. The census in October 1995 showed no signs of rhino in Sg. Atok. The 1991-1995 survey for Taman Negara which covers about 25% of the park, reported 2 - 4 rhinos. More areas are to be included in the near future to provide a more accurate estimate. The other rhino sites include Hulu Besut (3) in Terengganu and Sungai Depak (1), Sungai Sok (1), Sungai Terang (1) and Gunung Chamah (3) in Kelantan. The other areas surveyed with zero population included Sungai Lepar, Krau Game Reserve and Bukit Gebok in Pahang and Kuala Balah in Kelantan. Signs of human encroachment and habitat degradation were predominant.

### West Coastal Region

An estimated one animal thrived in the Sungai Dusun Wildlife Reserve and attempt to trap this animal failed. Several reports of track sightings were observed in the early 1990's. However, the most recent survey in April 1996 indicated the absence of Sumatran rhinos in the reserve.

## NORTH WEST REGION

### Belum

B. Thong (pers. comm.) briefly surveyed the lower section of the Belum River and found tracks of at least two rhinos. Until recently, Thong's observations were the only confirmed reports of rhino in this area. Up until the late eighties, almost the entire Belum region was considered a security area due to the prevalent communist activities and further surveys could not be conducted. Based on information from 1972, it was estimated that three to five rhinos may occur in the Ulu Belum area (Flynn and Tajuddin, 1984). In 1993, an estimate of 10+ was given for the number of rhino here. The 1994-1995 survey, which covered 100% of the Ulu Belum area showed to be five rhinos there.

### Selama

In 1977, B. Thong (pers. comm.) visited the salt licks of Selama and found fresh tracks of at least two rhinos. Flynn and Tajuddin (1984), tried to survey the Selama area, but were unable to gain access to the forest as the area was restricted by the police. Based on the previous track observations, they estimated there to be between three and five rhinos in this region. In 1993, an estimate of 10 - 15 rhinos were said to be in Selama. In 1990, three animals were observed in Sg. Selama, although in the most recent survey (1995), no evidence of rhinos were found in this area. A total of six rhinos were noted in the survey carried out between 1993 and 1995. A survey carried out by the Malayan Nature Society in 1993 in Bukit Kabut, Perak estimated a population of 2-3 rhinos. In 1994, a DWNP census showed the presence of only one rhino.

## NORTH EAST REGION

Although the area in Ulu Muda, Kedah and Mata Ayer Forest reserve in Perlis had historical records of having Sumatran rhinos (Stevens, Hubback, 1968; 1932), recent surveys in 1993 showed no evidence of rhinos.

Table 1: Estimated numbers of Sumatran rhino in Peninsular Malaysia.

Location	1979	1982	1984	1987	1989	1993	1995
Endau-Rompin	8-15	20-25	20-25	10-25	10-25	10-25	5**
Funung Belumut	–	2-3	2-3	3-4	3-5	3-4	1
Mersing Coast	–	2-3	1	5-6	5-6	3-5	2
Tenggaroh Reserve	–	–					1
Taman negara	4-6	8-13	8-12	22-36	22-36	22-36	2.4*
Sungai Lepar	2-4	3-5	3-5	2-2	2-2	1-2	0
Ulu Atok	–		–	1	1-1	1-2	0
Sungai Yong	–		–	3-5	3-5	3-5	–
Sungai Depak	2-4	3-5	3-5	2-4	2-4	2-4	1
Kuala balah	2-4	3-5	3-4	2-4	2-4	2-4	0
Krau Reserve	–	2-2	1	1	1	1-2	0
Bukit Gebok	–	1-2	1-2	2-2	2-2	1-2	0
Sungai Dusun	2-4	4-6	4-6	3-4	3-4	1-2	1**
Ulu Selama	–	3-5	3-5	6-7	6-7	12-19	6
Ulu Belum	2-4	3-5	3-5	2-4	2-4	10+	1
Sungai kenarong							1
Bukit Kabut							1
Bubu Forest	–		–	2-2	2-2	2-3	0
Besut	–		–	–	–	3-5	1
Kedah	–	1	0-1	1-2	1	–	0
Gunung Chamah							3
Sungai Sok							1
Sungai Terang							1
<b>TOTAL</b>	<b>22-41</b>	<b>55-80</b>	<b>52-75</b>	<b>67-109</b>	<b>67-109</b>	<b>77-130</b>	<b>28-30</b>

\* 25% area covered

\*\* 75% area covered

\*\*\* survey in 1996 showed absence of rhino connected to Sungai Karang Forest Reserve (unknown status)

– unknown



**Table references:**

- 1979 – Khan, M., 1982.
- 1982 – Khan, M., 1982.
- 1984 – Flynn and Tajuddin, 1984.
- 1987 – Khan, M., 1987.
- 1989 – Khan, M., 1989.
- 1993 – Anon, 1993.
- 1995 – Zainal- Zahari Z., et al., 1995.

## DISCUSSION

Although insufficient data existed to accurately estimate the number of Sumatran rhinos remaining in the world, with the evidence present at that time (Van Strien 1974; McNeely & Laurie 1977; Borner 1978; Schenkel & Schenkel 1979; Payne 1980; Van Strein, pers. comm; Flynn 1981; Flynn & Abdullah, unpubl. data.), Flynn and Tajuddin (1983) suggested a total number of less than 300. However, Khan, M (1989) provided an estimate of between 542 and 969, an increase of about 80 - 223% to have occurred in Kerinci Seblat, Sumatra, which states a population of 250-500 rhinos. The density estimate was calculated on a high carrying capacity of 1 rhino per 10km<sup>2</sup> (Van Strein, 1985a). Such estimates do not provide an accurate population count as they are area specific, depending on habitat type, sex ratio, security and the decimation of population or habitat.

The population estimate of Sumatran rhinoceros in Peninsular Malaysia increased by almost threefold from 1979 to 1989. This is related to more discoveries of rhino evidence and probable guesstimate. The estimated population of Sumatran rhinoceros for Peninsular Malaysia in 1992 and 1993 ranged from 120 - 140 and 77 - 130 animals respectively (Mohd Khan, 1992; Anon, 1993). This increase were mainly contributed by the marked increased in the estimated populations for Ulu Selama (12 -19) and Belum (10+). However, the method of extrapolation for the two populations were undetermined.

Taman Negara saw an incredible rise in population between 1984 and 1987. According to Flynn and Tajuddin (1984), tracks of young rhinos have never been recorded in Taman Negara, indicating that recruitment rate is extremely low. However, in 1987, the population had increased threefold (Table 1) but then showed no changes afterwards for seven years. Throughout the period of 1987-1993, the rhino numbers were maintained as 22 - 36. In 1995 survey, no rhinos were observed around

Sungai Atok, Sungai Chemara, Ulu Sungai Atok, Ulu Sungai Tahan, Ulu and Jenut Segantang. This could probably be due to logging in the adjacent Yong Forest Reserve. Although the survey areas were remarkably low (due to time constraint), it indicated that the high density areas reported in 1984 no longer indicate the presence of rhinos. More surveys must be carried out to determine more accurately the population distribution and trend in Taman Negara, particularly areas in Kelantan and Terengganu.

Habitat encroachment by Thai immigrants/poachers into Taman Negara has been continuously reported over the past years. The most recent confirmation was in November, 1995 with the discovery of about 15 Thais in a basecamp within Taman Negara. There is also an estimated 30 - 50 Thai immigrants within the park (Ramlah Abdul Majid, (pers comm). Habitat degradation, including illegal logging within Taman Negara has also been reported. The above cases have caused a decline in the number of rhinos around the upper Atok and Sepia river as shown in the 1991-1995 survey. These populations could have been pushed deeper into the park. The problems of habitat degradation and encroachment need to be eliminated rapidly if the remaining populations of Sumatran rhinoceros are to be sustained. The foreign intruders must be flushed out of the National Park before we can regard the remaining populations sustainable. A combined approach must be initiated among the military, police and the Wildlife department in such operation.

In Endau Rompin, the density of Sumatran rhinos varies from 1 animal per 40km<sup>2</sup> in a high density area to 1 animal per 80- 120km<sup>2</sup> in a low density area (Flynn and Tajuddin, 1984). In the recent survey (75% of total acreage) covering the high density area, the density averaged 1 animal per 91km<sup>2</sup> or a 56% reduction in numbers. However, no rhinos were observed within the low density area. Flynn and Tajuddin (1984) observed tracks of at least three young rhinos during their study in Endau Rompin. In addition, a minimum of three cow/calf pairs were seen between 1975 and 1981 indicating that the population in Endau Rompin is reproducing at a higher rate than the animals in Taman Negara. However, in the 1995 survey (estimated 5 - 10 rhinos), tracks of young animals or cow-calf pair were not sighted. The extrapolation is based on the population density of that particular area and not on a general carrying capacity as practised by some wildlife biologists. The results tabulated must also correspond to the entire area mentioned.

The Sumatran rhinos in Endau Rompin were reproducing at a rate of one animal every two years with at least three animals born during the period of 1975-1981 (Mohd Khan, 1982; Flynn and Tajuddin, 1984). However, between 1979 and 1982, the population is seen to have increased by 10 - 12 animals, a clear contrast to the

above statement. As from 1982, no population increase was seen in Endau Rompin. This is due to lack of survey being carried out and the use of previous published data as population estimates.

Flynn and Tajuddin (1983) stated that the Endau Rompin region had the most potential for maintaining viable populations of Sumatran rhinos in Malaysia, and that conservation efforts for this species should be concentrated here. In addition to this, their work had shown that Endau Rompin contained the largest and possibly the only reproductively viable population of rhinos remaining in the country. The size of Endau Rompin has been significantly reduced from 1600km<sup>2</sup> to 867km<sup>2</sup>. Of the current size, 489km<sup>2</sup> had been designated as a State National Park with the remaining 378km<sup>2</sup> (in the state of Pahang) still in waiting for approval from the relevant authorities. Therefore, the reduction in rhino estimates in the 1995 survey creates a more baffled scenario than was presumed.

It must also be mentioned that the Lesong and Pantii Forest Reserves adjacent to Endau Rompin were considered a possible retreat for small population of Sumatran rhinoceros. However, recent studies of the two reserves indicated that more than 80% of the forest have been logged. In Lesong Forest Reserve, the initial size of 6000km<sup>2</sup> was reduced to 940km<sup>2</sup> through logging. A prelogging inventory is being carried out in the remaining area. A similar trend was also observed in the Pantii Forest Reserve. A survey will be conducted randomly within the remaining forest to determine the possibility of discovering more rhinos.

In 1989, 2 - 4 animals were reported in Belum (Khan, M), by 1993, this had increased to 10+. There was no survey carried out in this area to substantiate the latter result which is based on guesstimate. In 1994, censuses of all potential rhino areas in Belum showed the presence of one rhino around Sungai Tiang. Belum was and still is considered insecure. In contrast, no increase was seen in either Taman Negara or Endau Rompin in 1993, the two supposed stable areas which have much larger populations than in Belum.

It is very apparent that no standard method is used to reach the population estimates in Table 1. The minimum number of rhinoceros is perceived as being the number of rhino known to occupy an area by either sightings or tracks. However, in some cases the number of animals known to occupy an area is multiplied by the size of the area.

A large increase also occurred in the unprotected area of Selama in 1993 (Khan, M) where the population doubled from 6 - 7 to become 12 - 19. A population of

only 6 rhinos was estimated from a survey in 1995. The status of these animals is uncertain as this area receives no protection. Similarly in 1984, only one rhino was reported to be in the area of Mersing Coast, Johor (Flynn and Tajuddin). By 1987, this had risen to between five and six animals (Khan, 1987). However in 1995, the estimated population ranged from 1 - 2 animals.

It has been suggested that a straight line transect method is the only way to accurately census the Sumatran rhino population. Such method has been effectively used to census rhinos and elephants in Africa and India. However, this method is impracticable to be utilized in the tropical rainforest due to the thick undergrowth and difficult terrain. The permanent transect method, utilized by Flynn and Tajuddin (1984), provided good database for population estimate of the Sumatran rhinoceros. It must be clearly understood that the methodology for estimating various species of wildlife depends on the species as well as their habitat. In the Sumatran rhinoceros, the total feeding area comprised 60% of the areas near stream bottom and 35% of lower slopes (Flynn, 1983). The ground-based permanent transect method was also used in all previous censuses done for the Sumatran rhinoceros, gaur and elephants; and biodiversity studies. The 1995 census technique using the same method is relatively accurate and comparable to previous surveys. Similarly, the current survey staff comprised of many individuals who participated in most of the previous surveys. Thus, the problem of reduced Sumatran rhinoceros population count should be viewed more professionally with an aim to improve their habitat and increase their numbers. However, it cannot be ruled out the possibility of viable rhino populations in the Main Range. Until and unless the censuses were carried out in those areas, we should regard the present situation as very critical.

There is clearly no doubts on the reliability of the most recent survey in 1995 which showed a marked decline in the rhino population of Peninsular Malaysia. However, the surveys have been confined to the traditional areas and routes taken by the rhinos. Basically, the same experienced officers involved in the survey over the years would be assigned to each team to ensure continuity and standardization of count. However, it must also be acknowledge that there are still areas unsurveyed including forest reserves and the Main Range which could possibly harbour viable populations. Such areas could then be accorded special protection to ensure population growth.

The previous surveys do not include new areas such as those adjoining Endau Rompin, vis-a-vis the Lesong Forest Reserve in the north and the Panti Forest Reserve in the south. These two forest reserves constitute more than the size of the existing Endau-Rompin. Unfortunately, it was also reported that about 10,000ha of

forest in the heart of Endau Rompin which forms the traditional rhino habitat were being logged (selective logging) over the last few years. The Sungai Karang Forest Reserve adjacent to the Sungai Dusun Wildlife Reserve have also yet to be surveyed for rhino population. Until other population are uncovered, the known population should be accorded immediate protection from poachers, habitat encroachment and degradation.

### RECOMMENDATION:

- \* Increase the number of personnel in the Rhino Protection Unit (RPU) from the present 35 to 60 to patrol and collect data on the existing Sumatran rhinos. These RPUs' should be given the responsibility of permanent patrolling of rhino areas
- \* Increase the protection of sensitive areas eg. Endau Rompin, Taman Negara, Selama and Belum.
- \* Increase surveys to include all forest adjacent to the National Parks and wildlife reserves
- \* Carry out intensive surveys in the potential areas of the Main Range
- \* Initiate GEF Phase II. Suggested by UNDP at the PPER meeting in Jakarta on 8th May 1996. Start requesting for additional fundings
- \* Accelerate village outreach program
- \* Continue and intensify efforts to apprehend the Thais within Taman Negara
- \* Initiate fund raising effort for rhino conservation
- \* Established buffers around all wildlife reserves and National Parks
- \* Recommend for more severe penalty to the Orang asli for possession of home-made firearms. They should be charged under the ISA
- \* Training and recruitment of new RPUs'
- \* Collective effort with the Department of Forestry in efforts to save the species
- \* Realization of the current situation as a national disaster of a flagship species

- \* Create captive nucleus within fenced up game reserves eg. Krau and Sungai Dusun where doomed animals can be relocated
- \* Translocate “doomed” rhinos into protected reserves to enhanced breeding
- \* Capacity building in the form of technical staff in rhino conservation - Geographic Information System professionals, fund raising team, reproductive biologist, field experts, and Rhino Patrol Units

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