

POPULATION MONITORING AND STUDY OF DAILY ACTIVITIES  
OF MALAYAN TAPIR (*Tapirus indicus*)

THROUGH THE USE OF THE CAMERA TRAPPING TECHNIQUE  
IN TARATAK FOREST RESERVE, SUMATRA, INDONESIA.



By  
Wilson Novarino

Biology Department, Faculty Mathematics and Science  
Andalas University, West Sumatra, Indonesia.

Reported to:  
Rufford Small Grant (for Nature Conservation)  
In association with the Whitley Laing Foundation  
2005



POPULATION MONITORING AND STUDY OF DAILY ACTIVITIES  
OF MALAYAN TAPIR (*Tapirus indicus*)  
THROUGH THE USE OF THE CAMERA TRAPPING TECHNIQUE  
IN TARATAK FOREST RESERVE, SUMATRA, INDONESIA.

Team Leader:  
Wilson Novarino

Members:  
Santi Nurul Kamilah  
Agung Nugroho  
Muhammad Silmi  
Muhammad Syafrie

## PREFACE

Indonesia has known as Mega biodiversity Country, which are most of that biodiversity threatened by effect of development program. Unsustainable timber product that was conducting in last decade promotes coverage loss, habitat loss, forest fragmentation, and waiting for extinction, before we know much what we knew. The IUCN Red list of Threatened Species (2003) note that 1205 animals from Indonesia, which three species listed as extinct, 411 species listed as threatened.

This report presenting results study of Population Monitoring and Study of Daily Activities of Malayan Tapir (*Tapirus indicus*) Through the Use of the Camera Trapping Technique in Taratak Forest Reserve, Sumatra, Indonesia whereas believed as one of remaining good habitat for them. Malayan tapir categorized as EN (Endangered) A1a-c + 4d, C1 species by IUCN (2004) and listed on appendix I CITES, recently the population trend of Malayan tapir still decrease. However, Malayan tapir observed both in primary and degraded forest, the major cause of population decline is reduction and habitat loss.

We do hope the information in this report would serve as an additional knowledge of the ecology Malayan Tapir, as well as a source of information for anyone who need it.

Padang, November 2005

## ABSTRACT

Study on Population Monitoring and Study of Daily Activities of Malayan Tapir (*Tapirus indicus*) Through The Use of The Camera Trapping Technique in has been conducted Taratak Forest Reserve, Sumatra, Indonesia. This study conducted since June until October 2005. Eight camera trap (Photo scout - Highlander) was deployed purposively thorough the study area 50 cm above ground level, and was checked every two weeks to change the battery and films. In total 25000 camera-hours was spend during this studies. At least 14 mammals species was recorded on this study area by using camera trap, which dominated by Pig tailed monkeys and followed by Common porcupine, Wild boar, Muntjak deer and Malayan tapirs. Data on tapir population was acquired based on image analysis where the scratch and border of white-black of the bodies and time of image captured as main parameter to identify tapir individual. Our results indicate the low population of tapir in this area (0.5 individual / km<sup>2</sup>). This studies shows that Malayan tapir is strictly nocturnal that peaks at 22.00 hours. The pattern of daily activity that recorded during this studies show that activity varied with other studies conducted on Malayan tapir. Based on vegetation and camera placements, tapir seem prefer secondary lowland forest, in relative flat and damp areas. The need of Malayan tapirs for salt licks is evidenced in their visit to these areas every time in each two-week sampling period. The tendency of movement into adjacent area during the rainy season also was observed.

## ACKNOWLEDGMENT

Many institution and individuals have been contributed in this research. Rufford Small Grant generously provided funding and I am extremely grateful for their trust and support. Special thanks to Patricia Medici, M.Sc, Chair of Tapir Specialist Group who have given us a lot of proposition for the research. I would also thank to Deborah Martyr (FFI Sungai Penuh Indonesia) and Iwan Setiawan (NGO-Movement) who has given us the reference for project proposed. Josh Cole thanked for a lot of information and administrative work during this project initiated. We would like also to thank Leo A Salas, PhD (TNC New Guinea), Dr. Rob G Lee (WCS Indonesia) and Carl Traeholt PhD (Malaysia) who was gives us very constructive idea according Camera trap system.

We would like to thank Head of Biology department Faculty of Science Andalas University that was give permit and support during conducting this research. M. Nazri Janra, David Gusman, Anjasmara, Henry, Rico, Radit, Thuram, all villager on Taratak village, especially Pak Yunus, Pak Mantam, Pak Pirin, Madi, Eman, Pak Ali, that was help us during conducting field survey. We also thank all who cannot mention in detail for their supports.

# CONTENTS

PREFACE.....	i
ABSTRACT.....	ii
ACKNOWLEDGMENT.....	iii
CONTENTS.....	iv
INTRODUCTION.....	1
MATERIAL AND METHOD .....	4
RESULTS AND DISCUSSION .....	6
CONCLUSION AND RECOMMENDATION .....	19
REFERENCES .....	20
APPENDIX .....	22

## I. INTRODUCTION

Tapirs are considered as 'living fossils', which representing an animal group that has changed little over the past 35 million years. There are four species of Tapiridae in the world of which three are found in Central and South America (*Tapirus bairdii*, *Tapirus pinchaque* and *Tapirus teristris*) and only Malayan tapir (*Tapirus indicus*) that distributed in South East Asia. Malayan Tapir lives in small population within their range in Peninsular Malaya and Sumatra (Indonesia, Laos, Malaysia, Myanmar, Thailand and Vietnam).

Malayan tapir or sometime refers as Asian tapir, is the largest of the four living species of tapirs. In West Sumatra Tapir are known by local name as; Tanuak, Cipan / sipan, Kampuah tengah duo, Simantuang, and Kudo arai. Their systematic record started since described by Desmarest in 1819.

Malayan tapirs are easily identifiable because they have a unique features, such as having four toes on the front feet and only three on the back, have a short trunk or proboscis, which provides it with an excellent sense of smell and the ability to pull leaves into its mouth, and distinctive black and white colorations. This coloration is used for camouflage and helps the tapirs evade predators. Total length of adult Malayan tapir is about 225 cm with around 350 to 400 kg weighing.

The Malayan tapirs are found in varied habitat, such as swamp, lowland, mountain, hill forest, secondary forest, dense scrub and oil palm plantation. Tapirs have been observed in forest edge, primary forest, secondary forest, forest concession, and some report observed their in the plantations, like rubber, and oil palms (Santiapilai & Ramono, 1990). In Kerinci Seblat National Park, the report notes the tapirs reach the area in altitude 2300 m (Holden *et al*, 2003).

However some author says there is no hunting conducted on this species, field observation and currently information available showing that Tapirs was captured and traded. Human tapir conflict in

Asia has been recorded since colonial hunters in Burma targeting this species as one of their trophies (Meijaard & van Strien, 2003). In Sumatra Khan (1997) reported that "in Bengkulu tapirs are considered a problem species for stripping bark from rubber trees. In 1999 one adult male tapir was found snared by local villager that setting up the trap around their "ladang" (small traditional plantation) for protecting their land from pest animal and after separated into small part, the trapped animal was sold as buffalo meat to the traditional market (Novarino, 2000). Information from the local people, some time they also sold the tapir meat to the Chinese market in Padang (capital city of West Sumatra). Holden, *et al.* (2003) found that tapir skeletal were used by traditional medicine man in local market and says as Rhino, Martyr (2004) found indication of the existence of illegal market on Tapir based on her investigation in Philippine zoo.

Conflict on tapir habitat occupation by people is the most serious threats to tapir. Agricultural encroachments were change the forest habitats that previously inhabit by tapir. Tapir was recorded as pest animal that some times feed on agricultural plant such as watermelon and gambir (*Uncharia gambir*). However tapir noted as lower pest animal rather than deer and wild boar. This conflict also stimulated by forest loss in Sumatra regarding on the rampant illegal logging in the last decade.

Regarding on their low population and reduced habitat available, Malayan Tapirs in Sumatra categorized as EN (Endangered) A1a-c + 4d, C1 species by IUCN (2004) and listed on appendix I CITES. In Indonesia, this species was protected under the law of nature protected since Dutch colonial government (1931), and continued with some new protected law by Indonesia Government.

Although, some transnational conservation agency work on Sumatran forest, only few attention has been paid on tapirs and usually their occurrence only recorded as the list of others mammals occurs on their fields work area. So far there is no long-term field study for Malayan tapir in Sumatra and the data currently available is



insufficient. Some field works still must be conducted to provide a clear view of their conservation status and future intervention needs.

The camera trapping technique has been used by many researchers in order to evaluate tapir populations, distribution, habitat use and daily activity, all crucial pieces of information for the design and implementation of tapir conservation programs (Wallace *et al.* 2002, Holden 2003). This technique is also very useful to study Malayan tapirs due to their character as shy, mainly nocturnal, extremely elusive animals that tend to avoid contact with humans.

The design and implementation of the present study aims to generate more precise estimates of Malayan tapirs demographic parameters, which were some of the priority recommendations listed during the Malay Tapir Conservation Workshop held in Malaysia, in August 2003.

## II. MATERIAL AND METHODS

### Study area

The study were conducted at the Hutan Lindung / protected forest in Taratak Village, located at 100-500 m asl, in the Eastern West coast of Padang (West Sumatran Province). The slope of this area varies from 0-2%, with fluctuations in several areas that can reach 40%. The habitat includes primary and mature secondary forest, traditional plantations and riverside forest vegetation dominated by Dipterocarpaceae, Myrtaceae and Fagaceae (Novarino 2000).



Fig. 3. Landsat image of study area

Several studies have been conducted in this area. The first project was the "Inventory of Biodiversity Potential in Protected Areas" which observed the presence of Malayan tapirs in Taratak Village. In 1999, intensive habitat and population studies sponsored by Kehati Foundation were conducted (Arbain *et al.* 2000). Novarino (2000) conducting study focused on feeding behavior, and Novarino (2004) coordinating Tapir population monitoring. In the future, we expect to turn this area into a permanent research station for Malayan tapirs.

## Methods

Placements of photo-trapping areas was chosen based on results from previous studies (Novarino, 2004), which identified salt licks and existing animal trails that seem like adequate locations for the placement of cameras. Eight Photo-Scout cameras (Highlander Sports Inc.) were used on this study; these were put into operation in June, 2005. Cameras were set up to operated 24 hours, with one minute delay time between pictures. Cameras are checked every two weeks to replace film and batteries. Three cameras were deployed at salt licks area and five along the animal trails in the surrounding forest. The placement sites varied in habitat, altitude (m a.s.l.) and location (see Table 1). Cameras were set up  $\pm$  50 cm above ground level, attached on trees with some branch for camouflage and protection from animal attacking.



Table 1. Characteristics of placement sites of camera-traps.

Camera	forest			altitude (m a.s.l.)	Distance from forest edge (m)	Habitat type	Location
	location	cover	stage				
1	edge	mixed forest	high degraded	183	150	salt lick	valley
2	edge	bamboo	secondary	250	1500	salt lick	valley
3	interior	mixed forest	secondary	319	2000	near salt lick	hill ridge
4	interior	mixed forest	secondary	534	2000	forest	hill ridge
5	interior	mixed forest	mature secondary	564	3000	forest	hill ridge
6	interior	mixed forest	secondary	668	3000	forest	hill ridge
7	interior	mixed forest	secondary	209	1000	salt lick	valley
8	interior	mixed forest	mature secondary	700	3500	forest	hill ridge

### III. RESULT AND DISCUSSION

#### A. LIST OF SPECIES OCCUR ON THE STUDY AREA BASED ON CAMERA TRAPPING IMAGE CAPTURES

Fourteen mammals and one bird species was photographed during this study. Those species are belongs to six Order of Mammals and one Galliform, completely shown on Table 1.

Table 2. Species images capture during fields studies

No	Ordo	Scientific name	Common name
	<b>Mammals</b>		
1	Artiodactyla	<i>Muntiacus muntjak</i>	Barking deer
2	Artiodactyla	<i>Sus scrofa</i>	Wild boar
3	Artiodactyla	<i>Tragulus javanicus</i>	Malay mouse-deer*
4	Artiodactyla	<i>Capricornis sumatraensis</i>	Mainland serow
5	Carnivora	<i>Panthera tigris</i>	Sumatran tiger
6	Carnivora	<i>Helarctos malayanus</i>	Malayan sun bear*
7	Carnivora	<i>Martes flavigula</i>	Yellow-throated marten*
8	Perisodactyla	<i>Tapirus indicus</i>	Malayan Tapir
9	Perisodactyla	<i>Hystrix brachyura</i>	Common porcupine
10	Pholidota	<i>Manis javanica</i>	Sunda pangolin*
11	Primata	<i>Macaca nemestrina</i>	Pig-tailed monkey*
12	Primata	<i>Macaca fascicularis</i>	Crab-eating monkey*
13	Primata	<i>Presbytis melalophos</i>	Mitered leaf monkey*
14	Rodentia	<i>Ratufa affinis</i>	Common Giant squirrel*
	<b>Birds</b>		
15	Galliformes	<i>Argusianus argus</i>	Argus pheasant*

Note: \* = Note recorded on previous study (Novarino *et al.*, 2004)

This result shows the effectiveness of camera trap for monitoring mammals species. Previous study that conducted by using track plot and located almost similar with recent study only detected six mammal species on this area and no Pheasant (Novarino *et al.*, 2004). Previous study failed to detecting primate species and small mammal. However, one species that detected on previous study (Sambar deer, *Cervus unicolor*) did not detected during present study. The absence of Sambar deer perhaps because as the diurnal species, their can not tolerance the high activity of local people around the area. Previous and recent hunting activity perhaps also affected their occurrence.

1. Barking deer (*Muntiacus muntjak*)

Common, images captured throughout studies periods at the five location of. However listed as protected animal on Indonesian conservation

regulation, this deer categorized as pest animal by local people due their activity that sometime feeding on agricultural area. Images was captured both day and night,



however most of images captured in the morning. This species is main target of hunter who set up the snare traps. At the end of studies periods, one individual was captured by hunter and sold at the Taratak villages.

2. Wild boar (*Sus scrofa*)

Common, images captured throughout studies periods. This species



is main large pest animal that usually feed in newly agricultural land and feed on ricefield. All images were captured during afternoon. Local people usually set up the specific

trap for this animal. All images are shown single individual, however this species usually lives on small group. During this study, the occurrence of sympatric species (*Sus barbatus*) that categorized as Near Threatened did not detect.

3. Malay Mouse deer (*Tragulus javanicus*)

Rare, only one image was captured during this study. This shy



animal image was captured at the salt lick in the early morning. The differences from other Deer species are based on body size, and their performance. According to local people; the low abundance was

affected by hunting activity to this species. This species categorized as protected animal in Indonesia.

4. Mainland serow (*Capricornis sumatraensis*)

Rare, only one image was captured during this study. This animal



listed on Appendix I CITES and categorized as Endangered according the decreased of population, hunting, habitat loss. This species also usually live near to the limestone area, which used as their main habitat.

5. Sumatran tiger (*Panthera tigris*)

Uncommon, Four images was captured during this study period.



This species listed on Appendix I CITES, and Critical Endangered due their low population, hunting, and loss of their habitat. Three individual was identified on this area.

6. Malay sun-bear (*Helarctos malayanus*)

Uncommon, three images were captured both daily and night. This



species was categorized as Vulnerable, listed on Appendix I CITES, and there is little information available on this species, especially in Sumatra.

7. Yellow-throated Marten (*Martes flavigula*)

Rare, only one image captured during this study. This journal species image was captured in the afternoon, however,



usually also found in the night. This species categorized as Endangered. The preys included are invertebrates, small vertebrates, honey and nectar.

8. Malayan tapir (*Tapirus indicus*)

Common, 23 images were captured during this study and all are at



the night. This species listed on Appendix I CITES, their conservation status was increased from Vulnerable into Endangered (for Sumatra population). This status comes according to habitat loss, low population, low regeneration

rates, and threat from hunting activities.

9. Common porcupine (*Hystrix brachyura*)

Common, 32 images were captured during this study both single



individual or in pair. This species is nocturnal (images taken from late afternoon until early morning). This species categorized Vulnerable by IUCN

10. Sunda pangolin (*Manis javanica*)

Rare, only one image was captured during this study. Single



species was captured at the mid night. This species listed on Appendix II CITES and categorized as Near Threatened. Trade on this species was recoded as main

threat for their existence.

11. Pig-tailed monkey (*Macaca nemestrina*)

Abundant, 119 images was taken during this study. This species



listed on Appendix II Cites and categorized as Vulnerable. Local people state this species as pest animal, some people also set up the snare trap for this species by using corn as bait. Individual captured usually

sold on traditional market and trained for climb and get the coconut.



12. Crab-eating monkey (*Macaca fascicularis*)

Uncommon, 22 images was captured during this study and all



taken at the afternoon. Listed on Appendix II CITES. Also was stated as pest animal by local people. However seen more compared Pig tailed monkeys, their occurrence

on camera trap are lower.

13. Mitered Leaf-monkey (*Presbytis melalophos*)

Uncommon, 15 images was captured during the study periods.



This species listed on Appendix II CITES. In Indonesia this species only found in Sumatra mainland.

14. Common Giant squirrel (*Ratufa affinis*)



Rare, one image were captured. This species listed on Appendix II CITES.

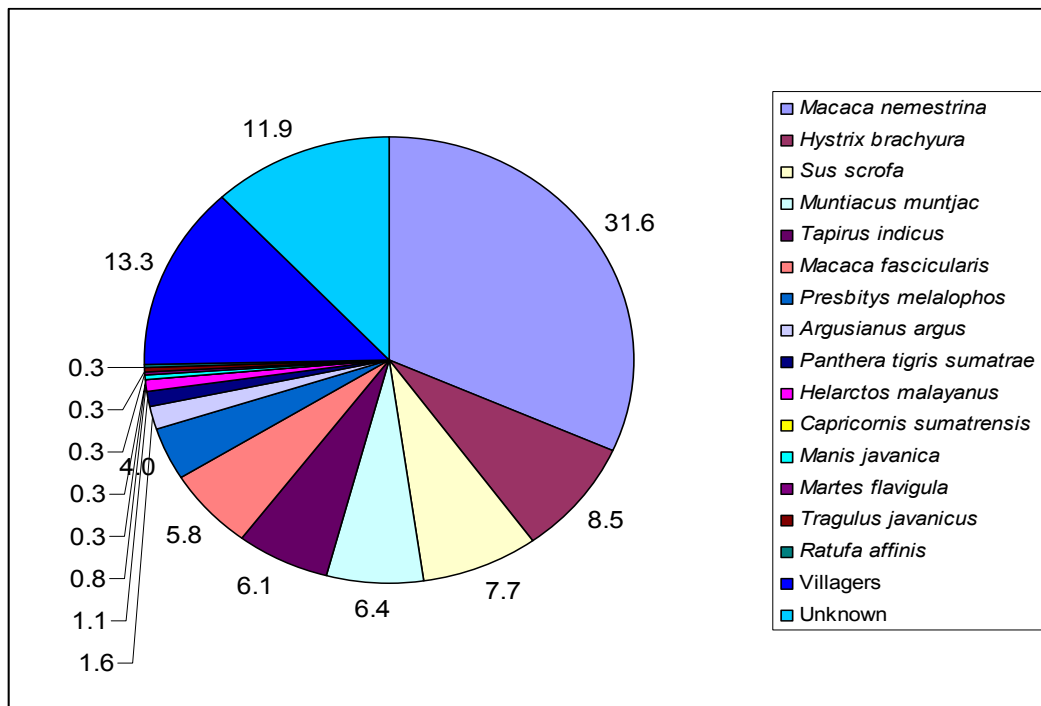
15. Argus pheasant (*Argusianus argus*)



Uncommon, six images were captured during this study. This bird inhabits lowland forest. Listed on Appendix II CITES and categorized as Near Threatened.

**Percentage of Occurrence Mammals Species**

Based on 25.000 hours of camera operations, 377 images were taken. Pig tail monkey note as the most abundant species followed by Common porcupine, Wild boar, Muntjak deer and Malayan tapir. Activity of local people also was recorded. The identity of animals in nine photos still unconfirmed due to the low of light intensity and targets are too small.



Species list and percent photo-capture of each species through eight camera traps in the Taratak Forest Reserve.

The high percentage of Pig tail macaque images captured during this study because this species lives on big troop, which distribute widely on Sumatran forest. High percentages on Common porcupine seem affected by camera placement that located near from bamboo forest, secondary and edge forest that note as their main habitat type.

Rank of percentage of Herbivores image captured during this study is similar comparing with gained by Kawanishi *et al.* (2002) in Taman Negara Malaysia, where their also found Malayan tapir, Barking deer and Wild boar respectively as three most common large mammals in their study area. Hence, Malayan tapir indicating their role as key players on regenerating forest process by grazing activity. The percentages of Malayan tapir that recorded in recent study (6.1 %) is lesser than previously study that recorded percentages 9.0 % (Novarino, *et al.* 2004) The differences also found at the rank of abundance.

Based on Camera placement and number of species images captured, the fourth camera was the best location, which capturing nine species, followed by first location (8 species). Only Malayan tapir and Common porcupine that occur on all of three salt licks area, however Crab eating monkeys are more distributed rather than other species.

Table 3. Species occurrence based on camera placements

Species	1	2	3	4	5	6	7	8
<i>Muntiacus muntjak</i>	x		x	x	x			x
<i>Sus scrofa</i>	x			x				x
<i>Tragulus javanicus</i>							x	
<i>Capricornis sumatraensis</i>					x			
<i>Panthera tigris</i>								x
<i>Helarctos malayanus</i>						x		x
<i>Martes flavinuca</i>				x				
<i>Tapirus indicus</i>	x	x	x				x	
<i>Hystrix brachyura</i>	x	x		x	x		x	
<i>Manis javanica</i>				x				
<i>Macaca nemestrina</i>	x	x		x	x			
<i>Macaca fascicularis</i>		x	x	x	x		x	x
<i>Presbytis melalophos</i>	x	x						
<i>Ratufa affinis</i>	x							
<i>Argusianus argus</i>				x				x

## **B. THE MALAYAN TAPIR**

### **Percentage of Occurrence**

Percentage ratio of tapir photo-captured per unit sampling effort (number of times that tapirs passed through the camera / number of trapping hours) during this study (0.092) is higher than previous studies in Kerinci Seblat National Park, where Holden *et al.* (2003), only record 0.017 – 0.081. This

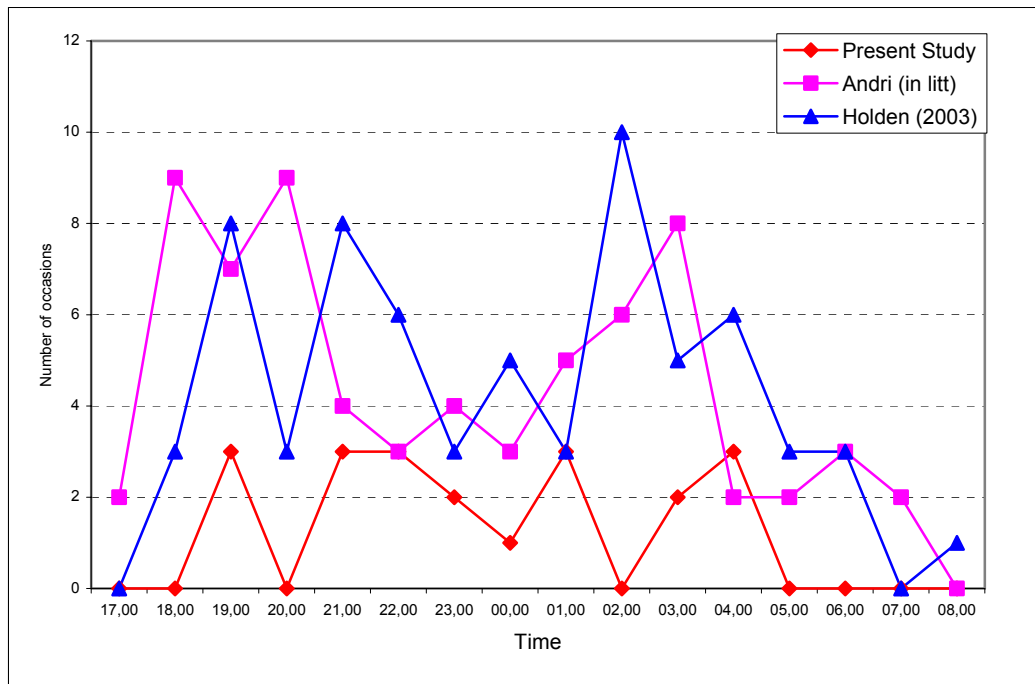
difference resulted perhaps as an effect of altitudinal and the camera placement, where in this study camera located near from salt licks



located on secondary lowland forest, which seem to be most preference habitat by Malay tapir. Kawanishi *et al.* (2002) also get the high result for tapir photographs when conducting camera trapping near or on the trails leading to salt licks.

### **Daily Activity**

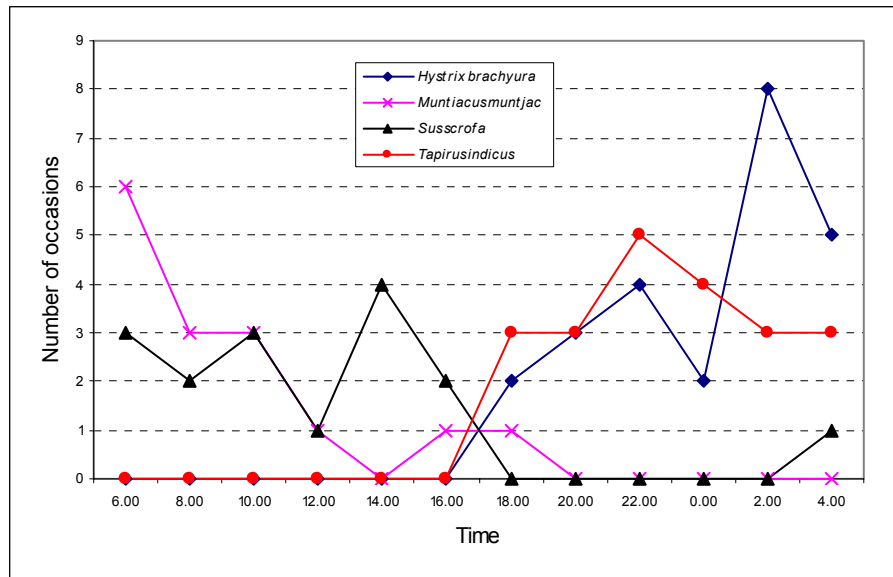
Early results also indicate that tapirs seem to be active mostly at night and tend to be solitary. All tapir photos are recorded at night and until early morning (19:57 to 04:25) and all are of single individuals. This result is different comparing with previous results gained by Holden *et al.* (2003) in Kerinci Seblat National Park, which were records the time of tapirs activity since 18.00 until 09.00. At the other parts of Kerinci (Sipurak) Andri (*in litt*) record that tapirs activities begin at 17.00 until 08.00. This difference perhaps as response of tapirs to the highly human activities on this area, which recorded as second highest number of images captured.



Time of tapir occasions that captured by camera trap at different studies site.

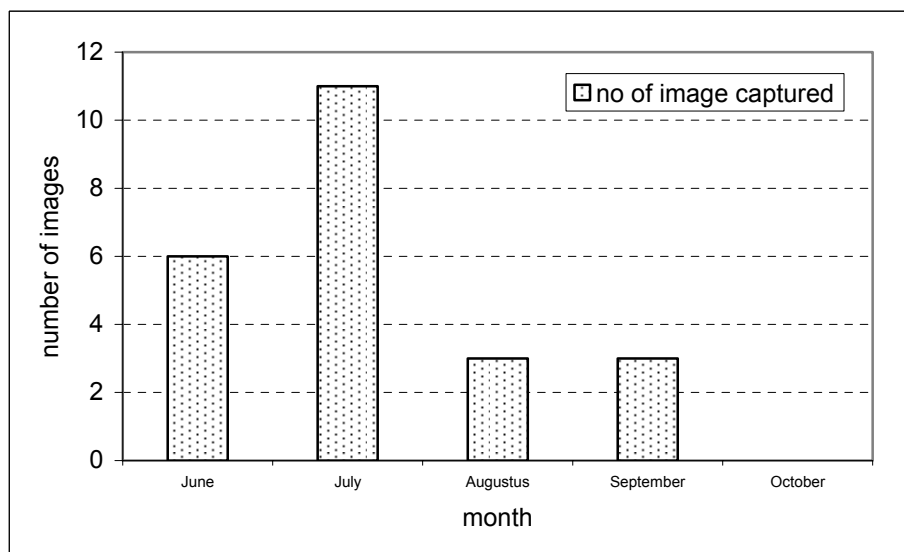
Predominant Nocturnal activity also recorded on Baird's tapir (Foerster & Vaughan, 2002), that resulted as behavior to avoid hottest time of the days. Wallace *et al.* (2000) found that, however Tapir tend to be nocturnal although some diurnal activity was recorded on Lowland Tapir. Bimodal pattern of activity also recorded on Mountain Tapir, which Lizcano and Cavalier (2000) record the activity of Mountain tapir during the early hours of the morning (5:00-7:00) and early hours of the evening (18:00-20:00).

This study also records the time segregation between Malayan tapir and other common herbivores. Time of tapir activity shown contrast with Barking deer and Wild boar. However the overlap record at the late afternoon and the early morning, as shown on picture below. Common porcupines seem to be more nocturnal rather than tapir, which shown by highly occasional of this species captured during the nights.



Time and number of occasion four common herbivore on study area

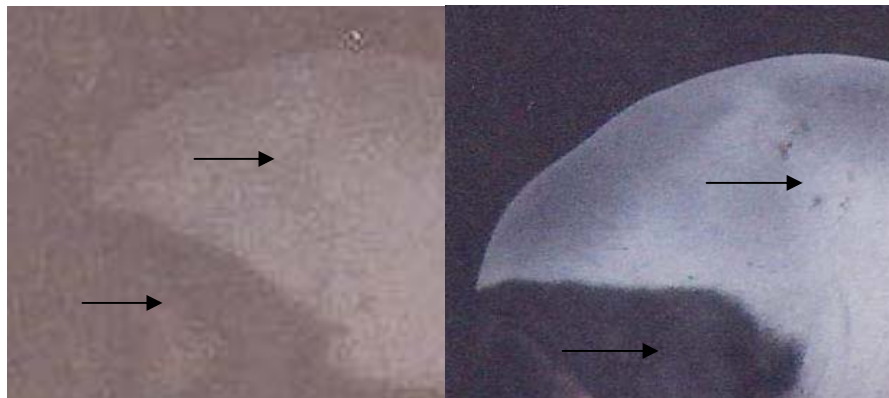
Based on month of observation, the highest number of images was captured during the July, as show on picture below. During October there is no one images was taken. This result indicates that tapir also have seasonal movement. October has been recorded as starting point to the rainy season, and the wet condition perhaps were stimulating tapir to moving out into adjacent area. This behavior also recorded by some authors (Santiapilai, 1990; Holden *et al*, 2003) that describe movement of tapirs into the higher area during the rainy season.



Number of images captured based on month observation

## Individual Identification

Analysis on image of tapir captured during this study, indicate that only two adult of tapir exist on this area. Identified were based on scratch on their body, difference on border of white and black color on their bodies and time of photographed. Two individual of tapir has photographed at the same time (differ only 5 second) on two cameras. With assumption that fourth cameras detecting the tapir located on 4 km<sup>2</sup> area and ignoring the fourth camera that did not detect the tapirs, the density of tapir in this area is 0.5 individual/km<sup>2</sup>. This number seem to be adequate point compared other studies, which demonstrate that density of Malayan tapir laid on 0.03 – 0.8 individual/km<sup>2</sup>.



Difference between two individual of tapir that captured on study area

## Preference to the Habitat type

With respect to camera placement, only four among the eight camera placement sites detect Malayan tapirs, those points located



near or in salt lick area and below than 320 m a.s.l.. These fourth camera placements also located nearly each other and fourth other camera located away from salt licks. Tapirs came to the salt lick in each of the two-

week intervals between checks. This result highlights the use and

importance of this area for Malayan tapirs. These results show that Tapir tend to prefer flat and damp area rather than dry area with high topographical slope or in hill forest. Tendency of Malayan Tapir to secondary forest rather than primary forest was recorded in previous studies (Novarino, 2004); this tendency also was recorded on other species of tapir such as Baird's tapir (Foerster & Vaughan, 2002).

### **Effect of distance from Forest edge**

This study shows that tapirs are observed on 150 – 2000 m.



from forest edge.

However this results perhaps more affected by the forest type and topography rather than distance. O'brien *et al.*

(2003) on their studies in Bukit Barisan Selatan National Park (BBSNP)

found that tapir were

photographed at approximately equal rates near and far from the forest edge.



## IV. CONCLUSIONS

At least 14 mammals species was recorded on this study area by using camera trap, which dominated by Pig tailed monkeys and followed by Common porcupine, Wild boar, Muntjak deer and Malayan tapirs. Two individual of Malayan tapir were identified on this area and given 0.5 individual/km<sup>2</sup> point of density. This study also shows the preference of Malay tapir on secondary lowland forest, with relative flat and damp area. The need of Malay tapir to salt licks indicated from their attendance on salt licks each two week, and there is no evidence effect of distance from forest edge on the occurrence of Malayan tapir. The tendency of movement into adjacent area during the rainy season also was observed. Common porcupines show that more active at night than Malay tapir.

This study also shows the efficiency of using camera trap for Malayan tapir monitoring. More long time of studies periods (minimum for two years) very recommended for acquiring more comprehensive data on Malayan tapir population. Study areas also must expanded into large area to covering different forest patch on landscape level.

## REFERENCES

- Arbain, A.; Jafnir, H.; Indra, G.; Novarino, W. & Jamilus 2000. Population Study of Malayan Tapir (*Tapirus indicus*) in Kerinci Seblat National park. Proceedings of the SRG-TNKS Kehati. Indonesia
- Foerster, C.R. & C. Vaughan. 2002. Home Range, Habitat Use, and Activity of Baird's Tapir in Costa Rica. BIOTROPICA 34(3): 423-437
- Holden, J. A. Yanuar & D.J. Martyr. 2003. The Asian Tapir in Kerinci Seblat National Park, Sumatra: Evidence collected through photo-trapping. Oryx vol 37 No 1: 34-40.
- Lizcano, D.J. & Cavelier, J. 2000. Daily and seasonal activity of the mountain tapir (*Tapirus pinchaque*) in the Central Andes of Colombia. *J. Zool., Lond.* 252: 429-435
- Khan, M. (1997) Status and Action Plan of the Asian Tapir (*Tapirus indicus*). IUCN Gland, Switzerland.
- Kawanishi, K. M. Sunquist & S. Othman. 2002. Malayan Tapirs (*Tapirus indicus*): Far from Extinction in a Malaysian Rainforest. Tapir Conservation Volume 11 No 1:23-27
- Meijaard, E & N. v. Strien. 2003. The Asian Tapir (*Tapirus indicus*). In Briefing Book, Malay Tapir Conservation Workshop. Krau Wildlife Reserve, Malaysia.
- Martyr, D. 2004. Sumatra, Indonesia. Tapir Conservation 13 (1): 30
- Novarino, W. 2000. Feeding Behavior of Malayan Tapir. Project Report.
- Novarino, W. 2001. Note on Malayan Tapir in west Sumatra. Poster. In: *Abstracts Book of the First International Tapir Symposium*. San Jose, Costa Rica.
- Novarino, W. Karimah, S.N., Jarulis, Silmi, M. & Syafri, M. 2004. Habitat Use by Malay Tapir (*Tapirus indicus*) in West Sumatra, Indonesia. Tapir Conservation 13 (2): 14-18
- O'Brien, T.G., Kinnaird, M.F. & Wibisono, H.T.. 2003. Crouching tigers, hidden prey: Sumatran tiger and prey populations in a tropical forest landscape. *Animal Conservation* 6: 131-139.
- Santiapillai, C. & Ramono, W.S. 1990. The status and conservation of Asian tapir in Sumatra, Indonesia. *Tigerpaper*, October-December, 6-11.

Wallace, R., Ayala, G. & Gomez, H. 2002. Lowland Tapir Activity Patterns and Capture Frequencies in Lowland Moist Tropical Forest. *Tapir Conservation* 11(2): 14

## PROJECT TEAM

### I. TEAM LEADER

Name : Wilson Novarino, M.Si.

Date of birth: Bukittinggi November 3<sup>th</sup> 1971

Occupation : Lecturer of Biology Department Faculty  
of Science Andalas University, West  
Sumatra Indonesia

Address: Jurusan Biologi FMIPA Universitas Andalas,  
Padang Kampus Limau Manis, Padang.

Telp. : 062 0751 777425

e-mail : [Wilson\\_n\\_id@yahoo.com](mailto:Wilson_n_id@yahoo.com)



### A. General course

1. Graduated of Andalas University West Sumatra.1995.
2. Post Graduated of Andalas University West Sumatra. 1998.

### B. Research

1. Population Structure of Bar-winged Prinia *Prinia familiaris* in Sipisang Village. (Higher Education Development Services Projects). 1998
2. Bird Community Structure in Kerinci Seblat National Park (Small Research Grant KSNP Kehati Foundation-Worldbank). 1998
3. Population Study of Malayan Tapir (*Tapirus indicus*) in Kerinci Seblat National Park (Small Research Grant KSNP Kehati Foundation-Worldbank). 1998.
4. Bird Community Structure in Biology Research and Studies Forest Andalas University. 1999
5. Feeding behaviour of Malayan Tapir (*Tapirus indicus*) in Taratak Village, Pesisir Selatan. (Tapir preservation Fund/ Tapir Club). 2000.
6. Senior Field Team of Component C Integrated Conservation Development Project- Kerinci Seblat National Park. 2001-2002.

7. Ecological Aspect of Hornbill in Kerinci Seblat National Park (Small Research Grant KSNP Kehati Foundation-Worldbank), 2001.
8. Population and distribution studies of Agile gibbon (*Hylobates agilis*) and Siamang (*Hylobates syndactylus*) in Kerinci Seblat National Park (Small Research Grant KSNP Kehati Foundation-Worldbank), 2001.
9. Population and distribution of Bar-winged Prinia *Prinia Familiaris* in Campus of Andalas University (Higher Education Development Services Projects Program), 2001.
10. Feeding behavior and microhabitat of Frugivorous bird Research Centre of Andalas University. 2001.
11. Bird Community Structure on Secondary Lowland Forest West Sumatra (Cheng Kim Loke Foundation, Canada) 2002
12. The Seasonality and Population Dynamics of Understorey Birds in West Sumatra lowland Forest. (Nagao Natural Environment Foundation) 2003.
13. Effects of deforestation on Malayan Tapir-Habitat and Mineral Lick Use. Wildlife Research Conservation Fund. 2003.
14. Population Monitoring and Study of Daily Activities of the Malayan Tapir (*Tapirus indicus*) Through the Use of the Camera Trapping Technique in Taratak Forest Reserve, Sumatra, Indonesia. Rufford Small Grant 2004.
15. Population status of *Cairina scutulata* and *Ciconia stormi* on lunang swamp forest and surrounding area. RSPB/ British Birdwatching Fair Research Fund for Endangered Species. 2005.

### **C. Seminar/Workshop**

1. Second Symposium of Asian Raptor Research and Conservation, Bandung, West Java. (Sponsored by Peregrine Fund) 2000
2. First International Tapir Symposium, San Jose Costa Rica, (sponsored by Gibbon Foundation Indonesia Program) 2001
3. Conservation Assessment and Management Plan workshop on Sumatran Threatened Species. Parapat. 2003.
4. Malay Tapir Conservation Workshop. Krau Wildlife Malaysia. 2003.

## F. Publications

1. Birds Community Structure of Research & Biological Studies Forest of Andalas University. (Jurnal Biologika No 3 1999 : Author) in Bahasa Indonesia
2. Morphological Character Analysis of Little Spider-hunter (*Arachnothera longirostra*) (Jurnal Biologika No 4. 2001: Author) in Bahasa Indonesia
5. Community structure of Understorey Birds in Edge Secondary Lowland Forest of West Sumatra. (Zoo Indonesia, (29): 51-58. 2002: Author). in Bahasa Indonesia
6. Avifauna Diversity on Concession area of PT. Nusalease Timber Corp. and PT Serestra II Jambi (Jurnal Biologika vol I no 9: 11-21. 2003: Author). in Bahasa Indonesia
7. Habitat Use by Malay Tapir (*Tapirus indicus*) in West Sumatra, Indonesia. Contributed Paper on Newsletter of the IUCN/SSC Tapir Specialist Group. Vol 13/2 no 16. 2004.

## Team Member



Name : Santi Nurul Kamilah  
Place / date of Birth : Paninggahan, 5 Mei 1977  
Occupation : Post graduate student of Univ. Andalas  
Address : Jl Sawahan dalam No 24 Padang

Name : Agung Nugroho, S.Si  
Place / date of Birth : Payakumbuh / 8 Januari 1980  
Occupation: Graduated student of Andalas University  
Address : Jl. Rawang Timur IV No.29 Mata Air, Padang





Name : Muhammad Nur Syafri  
Place /date of Birth: Bukittinggi/ 7 -11 1980  
Occupation : student of Biology Department  
Andalas University  
Address : Jl. Raya Balai Baru, no 14 A  
Padang, Sumatera Barat

Name : Muhammad Silmi  
Place / date of Birth : Tanjung Bonai/ 14 Juni 1982  
Occupation : student of Biology Department  
Andalas University  
Address : Jl. Sawahan III no 21 Padang 25121

