

# Population Density and the Conservation Status of Belitung's Tarsier *Tarsius bancanus saltator* on Belitung Island, Indonesia.

## Report

Submitted to:

The trustees of The Rufford Maurice Laing Foundation  
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## INTRODUCTION

Tarsiers (Tarsiidae, Order Primates) are a distinctive family confined to the Sunda Islands, the Philippines, and Sulawesi. Recently, eight species (Brandon-Jones *et al.* 2004 and see also Merker & Groves 2006) of the genus *Tarsius* are described; with the possibility of another new species from Sulawesi and its surrounding islands. One of the eight species is *Tarsius bancanus* Horsfield 1821 (Western tarsier), which restricted to Borneo, southern Sumatra, Bangka, **Belitung**, Karimata and the South Natuna Islands.

Among four subspecies of Western tarsiers, *Tarsius bancanus saltator* Elliot 1910 is restricted to the island of Belitung, Indonesia. Total land of the island is approximately 480.060 hectare, and human population is 215.859 based on data in 2002. During Dutch occupation the tin mining industry was began and is still continuing until now. The land surface was originally tropical forest, but since the development of palm oil industry in 1992 more than 40% of the land surface is oil-palm plantation. The other plantations are pepper, coconut, and natural rubber. There are some small lakes but most of them were constructed because of tin mining (<http://www.indahnesia.com/indonesia.php?page=SSEBEL>).

Tin mining and large scaled oil palm plantations directly or indirectly affect the natural habitats in Belitung Island. There is a permanent threat to the flora and fauna on the island, in fact there is no terrestrial conservation area on Belitung.

Almost all of the field study on western tarsier *T. bancanus* had been conducted in Borneo (e.g. Fogden 1974, Niemitz 1984, Crompton & Andanu 1986, 1987). There are very limited publications on the ecology of western tarsier *T. bancanus* in Sumatra, and no study at all been conducted on the Belitung Island tarsier (*T.b. saltator*). The IUCN red data book (Eudey *et al.* 2000) has further classified the endemic Belitung Island tarsier under the data deficient (DD) category. The species as well as subspecies also listed in Appendix II of CITES. Basic information is still needed for the conservation efforts of this small endemic nocturnal primate.

Tarsiers receive little conservation attention in its geographic range, Indonesia and Philippine. This lack of attention is probably because tarsiers are uncommon, elusive, rarely seen (because of their nocturnal habit), and competes for conservation attention of well-known flagship species, e.g.: Sumatran rhinoceros (*Dicerorhinus sumatrensis*), Sumatran tigers (*Panthera tigris*), Asian elephants (*Elephas maximus*), sun bear (*Helarctos malayanus*) and orang utans (*Pongo pygmaeus*).

The continuing deterioration of the forest-land in Belitung Island means that there is a high probability of the species becoming more threatened. A major goal in the conservation of a potentially endangered species, i.e the Belitung's tarsier, is the estimation of its population density and home range size. Therefore, as part of the larger study of the ecology and the conservation status of *T.b. saltator*, we conducted a study of the population density and home range size of *T.b. saltator* in a habitat type: secondary forest with small-scale logging and surrounded completely by oil palm plantation, on Belitung Island, Indonesia. This was accomplished by estimate animal densities, estimate the home range size, as well as food abundance and substrates for movements of the tarsiers. The study will identify critical resources for tarsiers' survival and adaptation in Belitung Island. Results of the study will provide information to improve conservation, wildlife management, forestry practices, and ecotourisms in the range where tarsiers exist, more specific in Belitung Island itself.

## **OBJECTIVES**

In the habitat type secondary forest with small-scale logging and surrounded completely by oil palm plantations, the specific study objectives included:

1. to provide an estimate of the population density of *T. b. saltator* on study site,
2. to provide preliminary home range estimates,
3. to discuss the implications of this new information in terms of the conservation status of the Belitung's tarsier,
4. to create and increase awareness of the local people; this will be accomplished by making leaflets, t-shirts, and conduct presentation and showing a self-made film/VCD.

## STUDY AREA

This study were conducted on Belitung Island, 107°35' - 108°18' Latitude and 2°30' - 3°15' Longitude. Belitung is an island in southeast of Sumatra and Bangka. The study was concentrate in the north-eastern part of the island where tarsiers are reported to exist (Bappekab Belitung 2003). Total land is approximately 4.833 sq km (<http://www.encyclopedia.com/html/B/Belitung.asp>). The climate is tropical, temperature around 27 - 31 C degree during the day and 23 -25 C degree during the night. The highest land is Gunung Tajam Mountain, located 25 km from Tanjungpandan (the district capitol), only 500m above sea level, still consisting of a wide area of forest. Tanjung Pandan is located on North West of the Island. The main resources are tin mining, kaolin, quartz sands, and granite rock. During Dutch occupation, the tin mining industry was established and still continuing until now. At the beginning of 1990s, the main tin exploration managed by the Government of Indonesia was officially closed, but the tin exploration and exploitation still continued by the local communities using *in-conventional* mining method. The land surface in Belitung was originally tropical lowland forest, but since the development of palm oil industry in 1992 more than 40% of the land surfaces are oil palm plantations. The tropical lowland forest in Belitung consist some plant species from Family i.e.: Dipterocarpacea, Fabacea, Sapindacea, Lauracea and Euphorbiacea (Bappekab Belitung 2003). Bappekab Belitung (2003) also reported that the only primates occupying in Belitung are long-tailed macaque (*Macaca fascicularis*), silvery leaf-monkey (*Trachypitecus cristatus*), and tarsier (*Tarsius bancanus*).

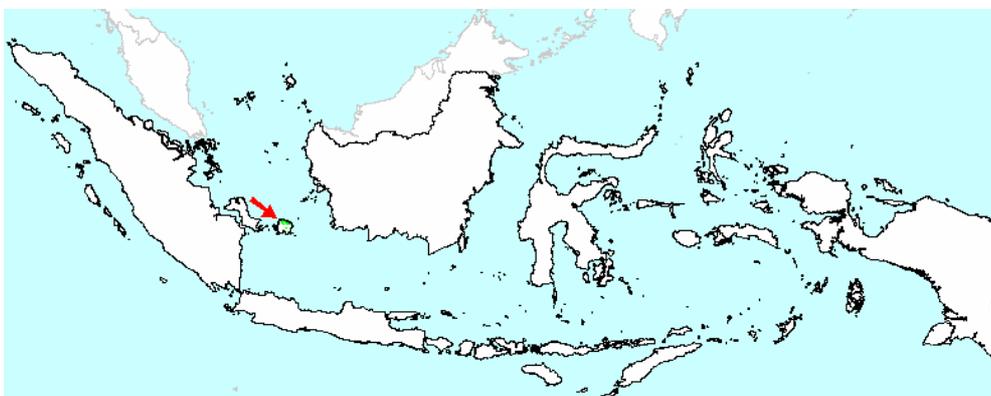


Figure 1. Belitung Island and the Nusantara Archipelago

Gunung Tajam Mountain, located 25 km from Tanjungpandan (the district capitol), is the highest land on the island. Even only 500m above sea level, the local people named it “mountain” (Bahasa Indonesia = Gunung). Gunung Tajam, with total area approximately 40 km<sup>2</sup>, still consists of a wide area of forest. Bappekab Belitung (2003) reported 26 plant species from 17 Family found in Gunung Tajam. Some economic plant species for example: *Hopea bilitonensis*, *Calophyllum* sp, *Aquilarria malaccensis*, *Palaquium rostratum*, *Ilex cymosa* and *Oncosperma horridum*. All three species of primates on Belitung Island can be found in Gunung Tajam area.

Gunung Tajam is also an ecotourism area, many people come especially on weekends. For subsistence purposes, such as woodpile or wood-house structure, the villagers and local people often chopping the trees from Gunung Tajam Area.

The field work for this study was taken from mid February to end of May 2006. The field work was focus on habitat type: secondary forest with small scale logging for the purpose of woodpile and surrounded completely by big oil palm plantations. This habitat located outside of Gunung Tajam Protection Forest. It is a reserved forest of the oil palm plantation company, with total area approximately 82 ha.

## **METHODS AND METHODOLOGY**

### ***Localization of Tarsier***

Localization of tarsiers had been done by recording urine marks as well as consultation of local people and scanning suitable habitats. Since the Belitung-tarsiers do not perform a duet vocalization in the morning (morning duets) like tarsiers in Sulawesi, the localization seems possible only by their urine marks on tree trunks. Indeed, tarsiers are more difficult to study than most other nocturnal mammals or primate because they do not possess a *tapetum lucidum*, the reflective layer behind the eye that helps observers locate most nocturnal mammals in the dark (Fogden 1974, Niemitz, 1984, Sussman 1999).

### ***Capture and radio collar attachment***

Tarsiers were captured using mist-nets. Three to five polyester mist-nets (length: 9-12 m; height: 2.10-2.70 m; mesh-size: 16 mm) were set up for each trapping occasion, from ground level up to 2.5 m above the ground in areas where tarsiers have been located. Nets were opened 1 to 2 h before dusk and at dawn, otherwise rolled down. We had checked the nets every 1 to 2 hours and cleaning it from trapped birds, bats, insects or other unexpected animals.

The mist-nets were transferred to other locations when no tarsiers were caught for 3 to 7 consecutive nights. Alternatively, individuals that evaded the nets were also captured by hand. Each captured individual was placed in a bag and weighed. Animals were examined through visual assessment, and palpation to determine gender, reproductive condition (pregnant, non-pregnant) and any injuries that might have been occurred during capture.

The radio-collar was ensured around the animal's waist. A hand-held radio receiver (STABO XR100-Radioscanner) was tuned to a frequency band of 150-151 MHz or to the appropriate frequency. The radio receiver was attached by a coaxial cable to a folding hand-held portable H-antenna. The maximum effective reception distance at the site was about 30-80 m depending on weather and vegetation density.

Adult individuals, more than 100 g weight, and the sub-adult male were equipped with radio transmitters (model PD-2C, Holohil Systems Ltd., Ontario) of different set frequencies within a 150 MHz band with an average life span of 6 months. The attachment procedure took approximately 20 minute and did not require the use of any immobilizing drug.

### ***Radio telemetry***

Radio-collared animals were tracked using a continuous monitoring. A single sampling shift are equivalent to 12 h: dusk (18:00) to dawn (06:00); 6 h: dusk (18:00) to midnight (24:00) or 6 h: midnight (24:00) to dawn (06:00). Continuous tracking involves following the movements of an animal through an entire sampling shift and taking bearings at 15-min intervals. Animal positions were estimated by triangulation of the signals from different fixed-reference points and record of the compass direction. Data derived from continuous tracking were used for the home-range analysis. Nightly travel distances were calculated using points from the 15-min interval tracking. The home range size of each animal was estimated using Minimum Convex Polygon method (Kenward 1987, White & Garrot 1990). The radio tracking was giving 65-85 locations for each tarsier, and each tarsier was radio-tracked over the course of ca. 1 to 2 weeks.

### ***Tree species***

To characterize the habitat within the study area quantitatively, a vegetation survey had been conducted using the Point-Centre-Quarter (PCQ) method in 16 randomly chosen points within each habitat type. Trees that higher than 1 m and  $\geq 10$  cm diameter breast height (dbh) were counted and their importance value index calculated. Importance Value Index indicates the frequency, dominance, and density of the plant species in a certain area (Brower *et al.* 1990).

### ***Substrate for Locomotion Abundance***

Density of locomotion supports: Based on results of habitat-use analysis by Crompton & Andau (1986, 1987) and Merker (2003), I measured the branch/trunk/sapling trees with diameter between 1-4 cm, in vertical and horizontal orientation, to analyse the substrate for locomotion abundance. Sampling method used PCQ, with the same 16 randomly points in each habitat.

### ***Insect's abundance***

Relative insect and invertebrate abundance: Two sampling methods were employed to estimate the abundance of insects and other invertebrates, at eight sample points and three replicate counts for different evenings over 19.00-21.00.

Light traps: were used for counting flying-insects. One petroleum lamp was hanged on the trees in 1.5 m height. Five minutes after set up the lamp, all flying-insects with body size  $\geq 1$  cm attracted to the light along 5 minutes were counted. By differentiating the animals by species, size and locations it was possible to avoid repeat counts of single specimen. Identified insects by this method mainly were moths, winged termites and mantids.

Insects Sound: At the same random points, singing or vocalizing insects in an area around radius 10-15 meters were counted along 2 minutes. Repeated counts were avoided by noting specific vocalization patterns and the locations of individuals. Identified insects by this method mainly were grasshoppers, crickets, and cicadas.

### ***Create and increase awareness of the local people***

Involvement of the local community in this study is one of the best ways to gain one of the objectives of this study. I have met the local community and discussed with representatives from Dusun air Begantung, Desa Kacang Botor about this unique creature. They were enthusiastic about the study and were willing to work together to ensure the survival of tarsiers. Three local people have been chosen to be my field assistant. A Few volunteers also have been identified to help in the fieldwork. Issues regarding setting up of the nets and where tarsier known exist also have been discussed with them.

I also made leaflets and t-shirts (please find the pictures in Appendix 1). It distributed to the local people, especially to them who go often to forest. At the end of field work, I have conducted a "presentation" about "the ecology of tarsier". I also documented some pictures and filmed the tarsiers and this work in general.

## RESULTS

In total, we captured 17 animals and radio-tracked 11 of them, i.e.: 5 adult males, 1 juvenile male, 4 adult females and 1 juvenile female in this habitat type. All captured animals were radio-tracked. More details and results from other habitat types will be published in my PhD. Dissertation.

### **Home Range Size.**

The average home-range size, which was estimated using Minimum Convex Polygon (MCP) method, was  $4.29 \pm 0.09$  ha for adult males and  $3.04 \pm 0.16$  ha for adult females. There was a significant differences in home-range sizes among adult males and females (Independent Samples T-test,  $P < 0.01$ ,  $n = 9$ ).

Table 1. The home range sizes of all captured and radio tracked tarsiers in habitat types secondary forest wit logging and surrounded by oil palm plantation on Belitung Island.

<b>secondary forest with logging and surrounded by oil palm plantations</b>	
<b>Animal</b>	<b>Home-range-size (Ha)</b>
M1H2	4,412
M2H2	4,352
M3H2	4,249
M4 H2	4,269
M5 H2	4,175
Mjuv1H2	0,993
F1H2	3,253
F2H2	2,883
F3H2	2,982
F4H2	3,057
Fjuv2H2	0,885
<b>Average <math>\pm</math> s.d.</b>	<b>Male: <math>4.29 \pm 0.09</math> Female: <math>3.04 \pm 0.16</math></b>

\* s.d = standard deviation. Juveniles were excluded in calculation of average  $\pm$  standard deviation

Concerning of the possibility that the sub-adult tarsier did not have a stable home range and was considered dispersing by its progressing incremental plot of home-range area, it was not included in the overall analysis of home-range data and nightly travel distance.

The pictures below show the home-range of Belitung's tarsiers on secondary forest with small-scale logging and surrounded completely by oil palm plantations

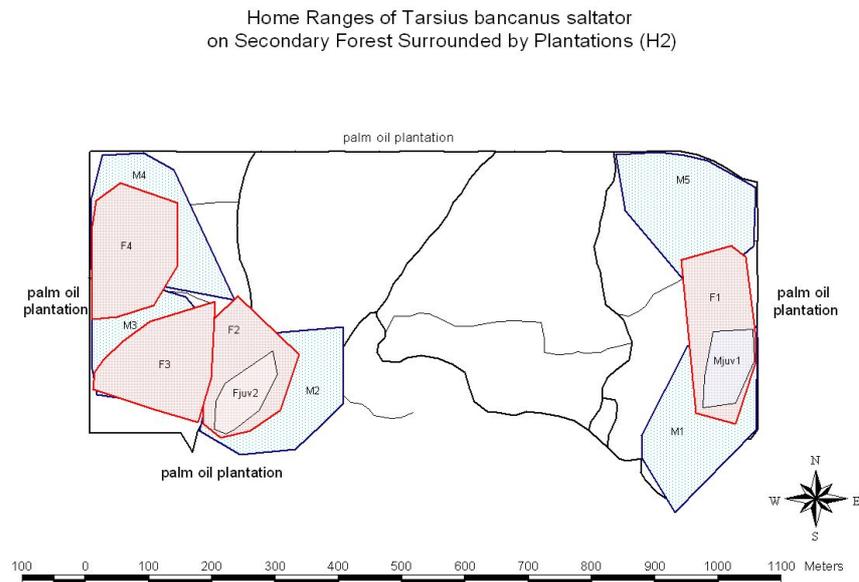


Fig. 2. The home range sizes of Belitung's tarsiers in secondary forest with logging and surrounded by oil palm plantations on Belitung Island, Indonesia.

The pictures above shows that home-range of one adult female could be visited by more than one adult male. It also shows that the adult male's range overlaps the range of more than one adult female. The Belitung tarsiers were observed to forage and sleep solitarily except for females carrying their infants (see figure 3).



Fig.3. An adult female with her offspring at their sleeping site.

### **Nightly travel distance**

Results of continuous monitoring were obtained for individual tarsiers for a total of 22 12-h shifts (dusk to dawn; 18:00 pm to 6:00 am). The mean distance travelled for five adult males (followed for a total of 10 nights) was  $993.59 \pm 59.15$  m and  $697.12 \pm 87.82$  m for four adult females (8 nights). The average nightly travel distance of adult males was significantly higher than adult females (Independent Samples T-test,  $P < 0.001$ ,  $n = 9$ ). Table 2 below show the nightly travel distances of Belitung's tarsiers in secondary forest with logging and surrounded by oil palm plantations.

Table 2. Nightly travel distances of all captured and radio tracked tarsiers in secondary forest with logging and surrounded by oil palm plantations.

<b>secondary forest with logging and surrounded by oil palm plantations</b>	
<b>Animal</b>	<b>Nightly travel distance (m)</b>
M1H2	1063.20
M2H2	963.51
M3H2	1014.24
M4 H2	1018.32
M5 H2	908.70
Mjuv1H2	n.a.
F1H2	776.83
F2H2	653.71
F3H2	594.60
F4H2	763.35
Fjuv2H2	n.a.
<b>Average <math>\pm</math> s.d.</b>	<b>Male: <math>993.59 \pm 59.15</math> Female: <math>697.12 \pm 87.82</math></b>

\* s.d = standard deviation. Juveniles were excluded in calculation of average  $\pm$  standard deviation

Casual observations during the day revealed that individuals were almost totally inactive. Aside from sleeping and resting, the latter characterized by the animal scanning its surroundings without any displacement from its sleeping site, except if there are any disturbances. Males tended to traverse the periphery of their range frequently and travel from one end to the other end, often using a different sleeping site from that used the previous night. Females followed a habitual path for several nights and changed to a new travel path subsequently. Females seemed to maintain a range only large enough to provide food for themselves and any offspring.

### **Population density.**

Based on the results (also from other habitat types which will be published in my dissertation) and other literature, some assumptions have to be underlying before we calculate the population density:

1. The sex ration of male to female is 1:1.
2. The male's ranges are more or less exclusive, no overlap between male's ranges.
3. Almost no space that's free of males.

From the pictures and table above, we can calculate the "absolute" population density of tarsier. In an area around 1 km<sup>2</sup> (100 ha), we could estimate the population density is about **25-26** animals, consist of 10 males, 10 females and also - assumed 50% of females gave births- 5 infants/juveniles.

Concerning that there are no primary forests in Belitung Island, the results show that *T. bancanus saltator* are quiet numerous in forest with small-scale plantations and logging on the island. However, the average captured animal per capture efforts show that secondary forest with logging and surrounded by oil palm plantation seems to be denser than secondary forest with small-scale pepper plantations and logging (see Table 3).

Table 3. Average captured animal per capture efforts (nets-hour)

<b>Habitat type</b>	Capture efforts (nets-hour)	Captured animal (individual)	Average (Nets-hour/animal)
secondary forest with small scale pepper plantations and logging	1201	11	109.18
secondary forest with logging and surrounded by oil palm plantation	868	17	51.06

### **Substrate Abundance**

The "substrate abundance" was measured to analyse the substrate for locomotors support. Only branches, trunks, and sapling trees with diameter 1-4 cm and in height of 1-5 m above the ground, in vertical and horizontal orientation was taken. Figure 4 shows the relative density of locomotion supports in secondary forest with small-scale logging and surrounded completely by oil palm plantations.

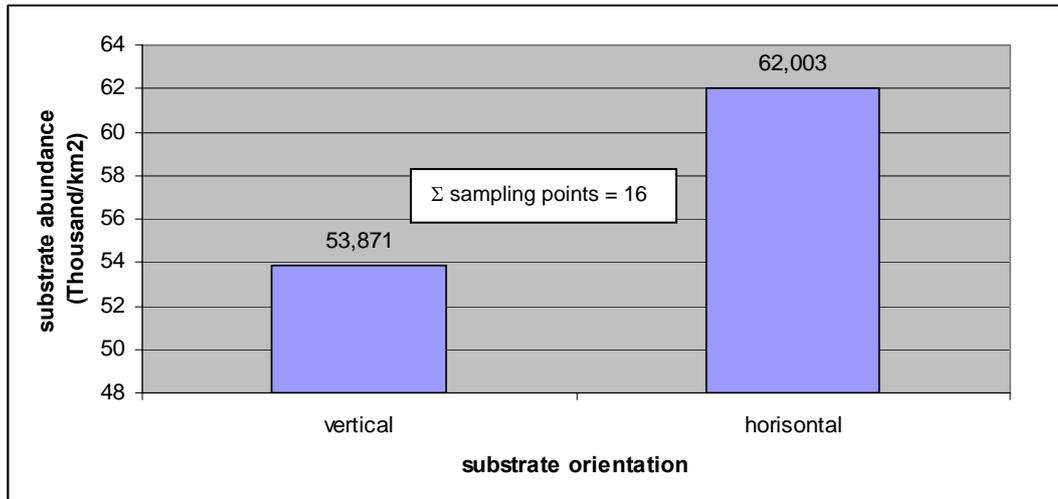


Fig. 4. The relative density of locomotion supports (in vertical and horizontal orientation) in secondary forest with small-scale logging and surrounded completely by oil palm plantations on Belitung Island, Indonesia.

### ***Insects' abundance***

The relative food abundance in the meaning of insects (vocalizing and flying insects) in habitat type secondary forest with small-scale logging and surrounded completely by oil palm plantations on Belitung Island could be seen in figure 5. Identified flying insects mainly were moths, winged termites and mantids. On the other hand, identified "vocal" insects mainly were grasshoppers, crickets, and cicadas.

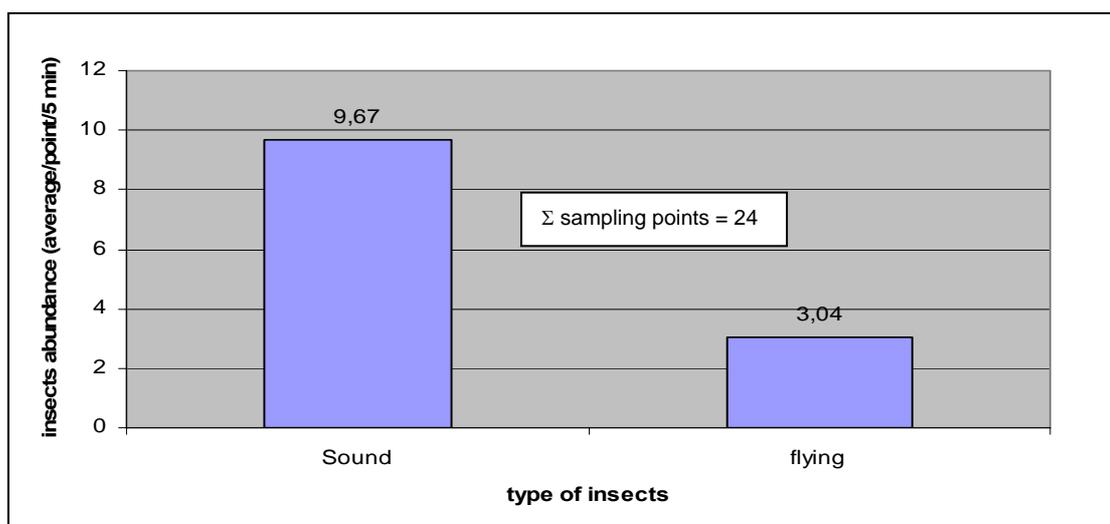


Fig. 5. The relative insect density in secondary forest with small-scale logging and surrounded completely by oil palm plantations on Belitung Island, Indonesia.

### ***Awareness of the local people***

There was a myth that tarsier could bring a “bad-luck” to villagers who met this tremendous nocturnal primate, especially when the villager goes to the forest to hunt mouse-deer (*Tragulus javanicus*). There was also a false opinion that tarsier is some kind of pest. But after they saw my work and see me wearing t-shirts with tarsier picture and after such a long time nothing was happened to me, they believe that tarsiers are just tremendous animal and they also proved that tarsier feeds only insects.

1500 exemplars of leaflets and 200 t-shirts were distributed to the local people, especially to them who go often to forest, to the representatives of the villages around Gunung Tajam area as well as to the representatives of local government in Belitung Regency. At the end of field work, I conducted a “presentation” about “the ecology of tarsier”.

Even though not finished yet, considered of asking from local people, a documented film (in VCD format) about tarsier on Belitung Island were distributed. We produced and distributed 250 VCD's. We did no editing job, just transferred the film and copied.

## **MANAGEMENT OPTIONS AND CONSERVATION IMPLICATIONS**

This study yielded original natural information on Belitung Island tarsier *Tarsius bancanus saltator* and added to our knowledge of tarsier ecology. To this end it was necessary to capture, radio collar and track this elusive nocturnal primate over a long period and also in another habitat type.

The results of this work underline that the Belitung tarsier is not restricted to primary forest. These Belitung tarsier were adaptable to secondary forest with anthropogenic influenced. The important is: tarsier need undergrowth for locomotor's support and sleeping sites.

The following implications can be drawn for the conservation of *T.b. saltator*:

**(1)** Propose the status of Gunung Tajam Protection Forest to be changed into a Nature Reserve for the tarsier and silvery leaf-monkey (*Trachypitecus cristatus*).

**(2)** The proposed tarsier reserve in Gunung Tajam, Belitung then could be promoted as a major tourist attraction of the island. Ecotourism can serve as a vehicle for promoting public awareness on conservation issues such as that of the Philippine tarsier in Corella (Neri-Arboleda *et al.* 2002) and Sulawesi tarsier in Tangkoko Nature Reserve, North Sulawesi. However, tourism can have long-term negative effects on reserves and communities if uncontrolled or improperly managed. The potential negative impacts of tourism in the area must be taken into account by concerned government and private agencies.

**(3)** Tarsiers require a diet of live prey and are difficult to maintain in captivity. Although there has been recent success in studying *T. bancanus* in captivity (Roberts, 1994), the record of captive births of tarsier remains low (Wright *et al.* 1986, 1987). Captive breeding does not seem to be a viable option for the species. Ex-situ conservation will therefore contribute little to the survival of the species.

**(4)** The results of this study show that the tarsiers maintain a medium-high density (25-26 individuals/sq km) using relatively small individual home-range area in a patch of forest. However, the absence of any designated protected area in forests where the tarsiers are known to exist would still make habitat destruction a major threat to their survival. Although *T. b. saltator* is mainly a rainforest inhabitant, several types of rainforest in different stages of succession are found in Belitung Island.

**(5)** Before any further management decisions are made for this species based on these results of home range, population density and habitat use, it would be beneficial to conduct similar studies in more contiguous forest. In order to compare population structure between habitats with varying levels of disturbance or non-disturbance, and determine which habitat type supports the most individuals for the optimum level of reproductive success of the subspecies.

Other potential avenues for research are:

(a) to examine edge effects on the population structure of the animals in varying proportions of forest fragments;

(b) in conjunction with the study on edge effects, to investigate the extent of usage of habitat corridors and relate corridor structure, i.e. length and width, to the dispersal rate of the animal;

(c) to conduct a longer field study covering both breeding and non-breeding seasons and examine variations of home-range size and configurations;

(d) to set up a GIS database on the tarsier's density and distribution, and map remaining available forest habitat in other regions in the Belitung Island where tarsiers are known to exist. The survey will show areas that could possibly be set up as a regional network of reserves, instead of just a protected forest as currently status in Gunung Tajam.

(e) the data from such studies would provide a better insight into how the tarsiers use different components of their habitat, and consequently generate sound management decisions for the species. Based on the gap of information on the ecology of the species that needs to be filled, the current conservation status of the Belitung tarsier as data deficient should remain until further studies are done and policies implemented to protect its habitat.

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**Appendix 1: Example pictures of leaflets and t-shirts**



## Appendix 2: Campaign leaflet about conservation of the Belitung's tarsier

### TARSIUS

#### Nama lain

Tarsius atau Tangkasi oleh masyarakat Belitung disebut Palele'an, sementara di Bangka disebut Mentiling atau juga Beruk Puar, di Sumatera disebut Kera buku ataupun Binatang hantu.

#### Ciri Khas

Tarsius merupakan salah satu jenis Primata terkecil di dunia yang unik. Secara umum dicirikan mempunyai mata besar dan telinga yang lebar dibandingkan dengan ukuran kepalanya. Tarsius dapat memutar kepalanya hampir 180° dan dapat melihat ke belakang tanpa mengubah posisi tubuhnya. Ekornya panjang hampir dua kali lipat panjang tubuhnya.

Kaki merupakan bagian istimewa dari jenis *Tarsius*, bahkan nama yang diberikan ada kaitannya dengan adanya ciri khas dari kaki (tarsus). Panjang kaki jauh lebih panjang bila dibandingkan dengan panjang tangan atau panjang tubuhnya. Hal ini berkaitan dengan cara Bergeraknya, yaitu meloncat.



#### Jenis dan Penyebaran

Di seluruh dunia, sampai saat ini ada 6 jenis tarsius yang hanya ditemukan di Indonesia, Filipina dan Malaysia.

*Tarsius spectrum*, mendiami dataran rendah dan hutan pegunungan rendah di Sulawesi;

*Tarsius pumilus*, hanya dijumpai di hutan pegunungan atau dataran tinggi di Sulawesi Tengah dan Selatan;

*Tarsius diana*, mendiami hutan pegunungan sampai ketinggian 1000 m dpl di Sulawesi Tengah;

*Tarsius sangirensis*, tersebar hanya di Pulau Sangihe dan Talaud di Sulawesi Utara;

*Tarsius syrichta*, mendiami pulau-pulau di Filipina bagian selatan;

*Tarsius bancanus*, dijumpai di Pulau Kalimantan atau Borneo (termasuk Sabah dan Sarawak), Kepulauan Natuna selatan, Sumatera bagian selatan, Pulau Bangka dan Pulau Belitung.



*Tarsius bancanus* memiliki ukuran tubuh lebih besar dibandingkan dengan jenis tarsius lain. Panjang tubuh jantan dan betina dewasa berkisar 120-150 mm, dengan berat tubuh dewasa sekitar 90-140 gram.

Species *Tarsius bancanus* dapat dibagi menjadi empat subspecies:

*T. bancanus borneanus*, tersebar luas di seluruh Pulau Kalimantan,

*T. bancanus natunensis*, hidup endemik atau hanya dijumpai di Kepulauan Natuna Selatan,

*T. bancanus bancanus*, tersebar di bagian selatan dan tenggara Sumatera termasuk Pulau Bangka,

*T. bancanus saltator*, hidup endemik di Pulau Belitung.

#### Habitat

Primata ini dapat dijumpai di hutan tropik primer dan sekunder. Kadang-kadang dapat dijumpai dekat perkebunan penduduk atau perkebunan kelapa sawit, bahkan hewan ini dapat dijumpai di perkebunan kelapa sawit yang tidak terawat atau lama tidak dikelola.

#### Makanan

Tarsius merupakan hewan pemakan serangga seperti belalang, kumbang, kepik, tonggeret, dan sebagainya. Primata ini juga dapat memakan kadal, ular, kelelawar dan burung kecil.

Gunung Tajam di Belitung merupakan salah satu habitat dimana Tarsius Belitung dapat dijumpai.



#### Perilaku

Tarsius keluar mencari makan dan melakukan aktivitas lainnya pada malam hari (*nocturnal*), hidup di pohon biasanya pada ketinggian 0,5 sampai 2 meter. Pergerakannya semi menggantung serta meloncat. Loncatannya dapat berupa loncatan tunggal maupun ganda dan dapat mencapai 3 meter atau lebih.

Tarsius sering membuang air kecil pada saat pindah pohon, sebagai tanda daerah jelajahnya.

Pada siang hari tidur di bawah kerimbunan daun dan tidak membuat sarang.

Penggunaan daerah jelajah tarsius jantan sekitar 8-11 Ha, sedangkan betina lebih kecil, antara 2 sampai 5 Ha.



#### Status Konservasi

Semenjak tahun 1931, tarsius sudah dilindungi berdasarkan Peraturan Perlindungan Binatang Liar No. 266 tahun 1931, diperkuat dengan Undang-Undang No. 5 tahun 1990, serta SK Menteri Kehutanan No. 301/Kpts-II/1991 yang dikeluarkan tanggal 10 Juni 1991.

Tarsius juga termasuk dalam daftar hewan yang dilarang diperdagangkan dalam daftar Appendix II CITES. Meskipun demikian IUCN (*International Union for Conservation of Nature and Natural Resources*, Lembaga dunia yang mengurus perlindungan alam), masih memasukkan tarsius, khususnya tarsius di Belitung, dalam kategori kurang data (*data deficient*). Hal ini berarti masih diperlukan penelitian-penelitian untuk melengkapi data tersebut sehingga dapat ditingkatkan statusnya.

#### Bagaimana Tarsius Belitung dapat bertahan hidup?

Tarsius telah banyak kehilangan habitat awalnya. Hutan-hutan primer sudah tidak ada lagi, ditebang untuk diambil kayunya, dijadikan lahan perkebunan, baik perkebunan lada oleh masyarakat maupun perkebunan sawit dalam skala besar, serta pembukaan lahan untuk tambang timah inkonvensional. Primata ini juga sering diperjualbelikan atau bahkan ditembak oleh masyarakat yang pergi berburu, sekedar membuang sial ataupun melepas peluru pada senapan anginnya. Padahal tarsius sama sekali tidak pernah mengganggu ataupun merugikan manusia, pun sama sekali tidak mendatangkan kesialan seperti yang selama ini diyakini oleh penduduk yang pergi berburu.

Kewajiban kitalah sebagai masyarakat pemilik kekayaan alam ini untuk menjaga dan melestarikan hewan yang hanya hidup di daerah kita ini.

Keunikan dan penampaknya yang eksotis dapat menjadi daya tarik ekowisata dan sedikit banyak dapat meningkatkan pendapatan masyarakat setempat.

## LESTARIKAN TARSIUS BELITUNG (PALELE'AN)



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## Appendix 3: Financial report

Local Currency 1: IDR 17,250.00 = £ 1.00

Local Currency 2: EUR 1.479 = £ 1.00

(Exchange rate on 5 December 2005, source: www.yahoo.com)

Column E = Column B – Columns C – Column D

	A	B	C	D	E
Item	Total Cost in Local Currency	Total Cost in £sterling	Amount Covered by Personal Funds	Amount Covered by Other Funding sources	Amount Covered by RSG in £sterling
<b>Living expenses</b>					
Housing Rp. 500,000/month (4 months x Rp. 500,000)	Rp. 2,000,000	115.94	0	0	115.94
Food Rp. 50,000/day (4 months x Rp. 1,500,000/mnt)	Rp. 6,000,000	347.83	0	0	347.83
Local Transportation (Rent a motorbike + benzene Rp. 2,000,000/month) 4 months x Rp. 2,000,000	Rp. 8,000,000	463.77	0	0	463.77
<b>Travel expenses</b>					
Airfare (Frankfurt –Jakarta- Frankfurt) x 2, @ € 839.00*	€ 1678.00	1134.55	0	£ 1134.55	0
Transportation to field-site (Jakarta-Tanjung Pandan- Jakarta) x 2, @ Rp. 950,000	Rp. 1,900,000	110.14	0	0	110.14
Departure Tax: 2x @ € 163.01*	€ 326.02	220.43	0	£ 220.43	0
<b>Materials</b>					
Calliper & Mass band	€ 50.00	33.81	0	0	33.81
Refurbishing transmitter + Delivery cost (10 pcs, @ € 65.00)	€ 650.00	439.49	0	0	439.49
Mist nets (6 pcs, @ € 60.00)	€ 360.00	243.41	0	£ 243.41	0
Rent's fee for radio-tracking receiver + antenna	€ 150.00	101.42	0	0	101.42
Leaflet (designing + editing)	Rp. 1,500,000	86.96	£ 20.0	0	66.96
Leaflet (printing 1500 exp.) @ Rp. 1,500	Rp. 2,200,000	127.54	0	0	127.54
Mini DV cassette 10 pcs @ € 3.00	€ 30.00	20.28	0	0	20.28
VCD (transferring)	Rp. 1,500,000	86.96	0	0	86.96
VCD copying (250 exp) @ Rp. 50,000	Rp. 12,500,000	724.64	0	0	724.64
T-shirt designing	Rp. 1,500,000	86.96	£ 6.96	0	80.00
T-shirt reproducing (200 pcs @ Rp. 75,000)	Rp. 15,000,000	869.57	0	0	869.57
<b>Other expenses</b>					
Payment for Field Assistants (3 person, Rp.50,000/pers/day) 4 months x 30 x Rp. 150,000	Rp. 18,000,000	1043.48	0	0	1043.48
Refreshment for presentation (at the end of project)	Rp. 1,350,000	78.26	0	0	78.26
Communications (inkl. Internet) 4 months x @ Rp. 750,000	Rp. 3,000,000	173.91	£ 53.91	0	120.00
Administration for Research permit etc. (local Authority)	Rp. 3,000,000	173.91	£ 73.91	0	100.0
<b>Total Column B</b>		<b>6683,24</b>	<b>Total Column E</b>		<b>£ 4930,07</b>
<b>Total Project Cost (in £sterling)</b>			<b>Amount Covered by RSG</b>		

\* with Malaysia Airlines; source: [www.explorer.de](http://www.explorer.de). Airfare + tax cost were paid by DAAD.