

# **Preliminary Report on Wildlife Inventories and Assessment in SFM Project Areas**

## **Timimbang – Botitian Forest Reserve**



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Survey Period  
**7<sup>th</sup> May – 16<sup>th</sup> May 2014**

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## **Acknowledgement**

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Deepest thanks to Mr. Zainal Kula, Mr. Sarinus Aniong and Mr. Yoktan Julbit from Sabah Forestry Department through District Ulu Segama – Malua for working hard for helping during the wildlife inventories and assessment that were conducted in May 2014. I am also thankful to all those involved, whose indirect presence did help in the completion of this activities.

## ABSTRACT

General wildlife survey was conducted in May 2014, given short period of survey and small group members with large area covered, some method and direction been formed intended to conducting wildlife survey in SFM project areas, 18 large terrestrial mammals species from twelve (12) different families were detected, (3) species were classified as schedule I (totally protected), 11 species known as schedule II (protected species-limited hunting with license) and 4 species inclusive as schedule III (protected species-hunting with license) under Wildlife Conservation Enactment 1997, 55.56 percent (*species, n=10*) are classified as threatened species and 38.89 percent (*species, n=7*) least concern in IUCN red list, the most and common species detected was the *Sus barbatus* with a percentage of 43.48 per cent while amongst the least detected which 2.17 per cent were *Neofelis nebulosa*, *Arctictis binturong*, *Macaca fascicularis* and *Mydaus javanensis*.

None direct Orang-utan or nest sighted during survey but it was reported by SFD field staff (Rozaimie, A., *pers.coom.*) to be present in Timimbang forest reserve part A in 2007. There is no gibbon sighted or call was heard during the wildlife assessment in Botitian forest reserve but the senior rangers which base in Botitian station sometimes heard the sound of gibbon calling. In fact, if a few gibbons are still roaming within Botitian FR but they are completely isolated from other forest and it is the main threat to the long term survival, 5 primate species were detected and recorded during the survey which 4 species were sighted known as diurnal which 2 species of macaque (*Macaca fascicularis* and *Macaca nemestrina*), Bornean gibbon (*Hylobates muelleri*), Maroon langur or Red leaf monkey (*Presbytis rubicund*) and one species of nocturnal primate namely Slow loris (*Nycticebus coucang*). The general elevation has categorize with ranged from 0 meter-100 meters, 100 meters-200 meters, 200 meters-300 meters, 300 meters-400 meters, 400 meters-500 meters and more than 500 meters.

Based on current and past studies as well as interviews presented 37 species from 17 families of were identified and recorded existed within SFM Timimbang-Botitian project areas, 40.5 percent (*species, n=15*) listed as Threatened species, 2.7 percent (*species, n=1*) Near Threatened, 48.65 percent (*n=18*) classified as Least Concern and 8.11 percent (*n=3*) known as Data Deficient in the IUCN Red List.

The bird's surveys conducted between three (3) different sites in SFM project areas namely Botitian FR, Timimbang FR part A and Timimbang FR part B, 9 birds observation spots established, direct and indirect sighting through the transect is the foremost methods, more than 160 species of birds from 38 families were recorded throughout the survey which 27.3 percent (*species, n=44*) species are classified as Near Threatened (NT) and 1.9 percent (*species, n=3*) species are classified as Vulnerable (V) in IUCN red list, there rest species been recorded mainly classified as Least Concern (LC) which consist to 70.2 percent (*species, n=113*) under the IUCN red list. The birds' population was more diverse in Timimbang FR part A and followed by Botitian FR, open area could be given way to new communities of birds occurring in SFM project areas.

## List of terms and Abbreviations

ADFO	Assistant District Forest Officer
BC	Base Camp
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DD	Data Deficient
DFO	District Forest Officer
FR	Forest Reserve
FMU	Forest Management Unit
FMP	Forest Management Plan
FCS	Forest Checking Station
GPS	Global Position System
HCVF	High Conservation Value Forest
IUCN	International Union for Conservation of Nature and Natural Resources
KM <sup>2</sup>	Square Kilometer
KM	Kilometer
LC	Least Concern
NT	Near Threatened
OU	Orang Utan
SFD	Sabah Forestry Department
SWD	Sabah Wildlife Department
SFMs	Sustainable Forest Management
VU	Vulnerable
WCE	Wildlife Conservation Enactment

## 1.0 INTRODUCTION

Wildlife distribution and species diversity such large terrestrial mammals and birds within Forest Management Units (FMUs) is significant information for the Sustainable Forest Management (SFM) requirements. All information gathered being contributed to select conservation area especially within FMUs properly, to evaluate performance of current management scheme, and improve the effectiveness and efficiency of the forest management plan (Sajama and Ong 2012). The forest certification schemes such as provided by Forest Stewardship Council (FSC) have been formulated to promote SFM. These schemes define the criteria and standard of SFM of FMUs (Hanlon et al., 1989; Forest Stewardship Council, 1996). So, in order to achieve the forest certification criteria and requirements of establishment SFM, Sabah Forestry Department through wildlife unit were implemented a basic baseline data on wildlife survey and monitoring programs in SFM Timimbang-Botitian forest reserve. The activities were conducted in 8<sup>th</sup> May 2014 till 16<sup>th</sup> May 2014 in view to prepare of an extensive Sustainable Forest Management.

There are only a few censuses of large terrestrial mammals over the FMUs until now (WWF Malaysia 1982; Ambu 2000). One of the main issues highlighted is the technical difficulty to practice the wildlife survey in a large spatial. To ensure wildlife monitoring and observation is made more successfully, we were developed random observation between three different sites in SFM project area namely Botitian FR, Timimbang FR part A and Timimbang FR part B by using any existing access. Direct and indirect sighting (footprints, vocalizing, feeding signs, dung etc) will be used to records as indicator of wildlife presence within the SFM Timimbang-Botitian project area. All information gathered from the past and current studies also was compiled to obtain a list of large terrestrial mammals and birds species found in SFM project areas. The preliminary report on wildlife inventories and assessment has presented the result and current situation of large mammals species existed in SFM Timimbang-Botitian.

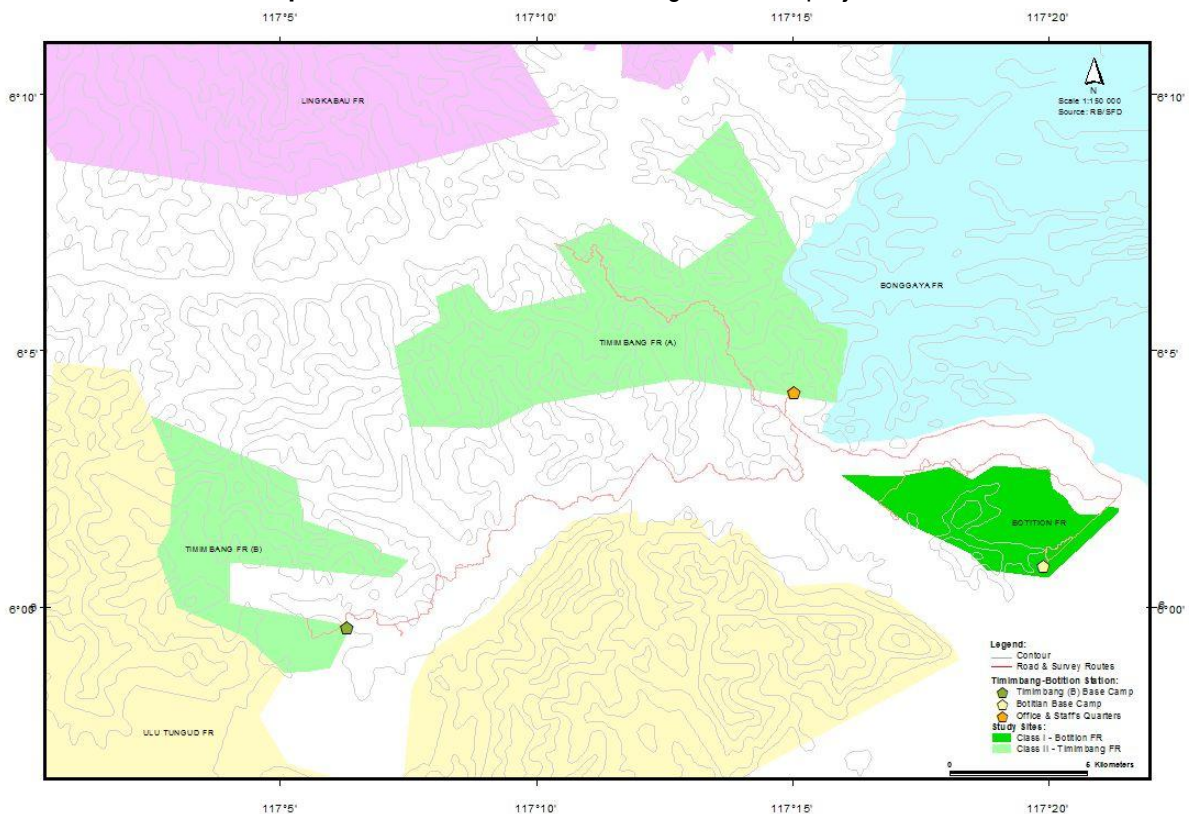
### 1.1 Study Area

Botitian forest reserve (class I) approximately consist about 2,145 hectares of mixed dipterocarp forest and it was located 25000m northwest of Beluran district. The river Tungud is bordering the northern part of the forest. Today, the forest is completely isolated and 49.14 percent of forest covered classed into stratum 4 (very poor which 1-4 emergent trees, 20-45 M<sup>3</sup>/ha) and it was surrounded by extensive oil palm plantations established by large companies (Sinokoh, PAMOL and Fortune) or small holders from nearby communities. Gravel roads are found everywhere around the forest. These roads are extensively used by local communities and oil palm estates; they providing an easy access to most parts of this forest. In addition, two active roads are crossing the forest reserve. The new highway linking Sandakan to pitas cut the western edge of this forest. Several hectares of forest were completely lost when this road was built a few years ago. An active gravel road cut to the eastern tip of the forest contributes further disturbance to the forest. Some settlements are located closest to this forest reserve (Botitian, Nangoh, Basai and Kamansi).

Timimbang forest reserve area compressed and separated with two parts which is part A consisting to 7,927 hectare and sitting in adjacent to Bonggaya forest reserve, while the Timimbang part B consist about 3,538 hectare and situated in adjacent to the forest reserve class II Ulu Tungud. Both areas been heavily logged under the conventional logging system and impacted very poor regenerating forest

structure, more than 70 percent of Timimbang forest reserves covered (both A&B) classed into stratum 4 forest which means the forest very poor with 1-4 emergent trees (20-45m<sup>3</sup>/ha). Rugged topography and blanketed by the green hill dipterocarp forest of the areas provides sort of promising refuge for wildlife particularly those of the large terrestrial mammals' species. However human disturbance (especially hunting pressure) and oil palm plantations development surrounding the project areas may have impacted on the distribution and population status of certain wildlife especially large mammal's species.

**Map 1: Locations of SFM Timimbang – Botitian project area**



## 1.2 Objectives

The main objectives of the rapid wildlife survey and assessment programs are as follows;

- i. To conduct general wildlife survey and assessment of large terrestrial mammals in selected sites for Sustainable Forest Management project area Timimbang – Botitian forest reserve.
- ii. To determine the status of wildlife diversity presence (especially large mammals and birds) in Sustainable Forest Management Project area Timimbang – Botitian forest reserve. All related data (past and current study) will be collected to present the wildlife presence in Timimbang-Botitian forest reserve. This is significant effort to ensure that all wildlife species found can be used as a basic baseline to implement the wildlife management plans in future.
- iii. To gather general information in relation to the major threats to maintain the wildlife diversity status in long-term in Timimbang-Botitian forest reserve.
- iv. To undertake direct and indirect practical training sessions (fieldwork) to Sabah Forestry Department staff itself (Timimbang – Botitian staff's) and the team that will be in charge and implement the wildlife monitoring programs in future.

## **2.0 METHODOLOGY**

The methods that have been used were direct and indirect sighting through transect, recce walks, night spotting, camera trapping, morning drive, opportunistic sighting and direct interviews with the rangers those working in Timimbang-Botitian. All methods used were adopted and followed from the comprehensive field manual of monitoring large terrestrial mammals in Sabah by Ancrenaz (2013).

### **2.1 Recce Walks**

The survey randomly walked through the forest by foot with following easy paths such as existing trails, logging roads, and ridges. This method is easily practiced by forest rangers in particular to cover longer distances in short times. The recce walks normally started as early as 6:00am and ended at around 11:00am, but it depends on circumstances of study areas and weather conditions. The observation was conducted without predetermined direction, and maximum only three (3) surveyors were required to conduct the surveys. This method is significant for the period of express assessment with the new areas being explored. Each study site has been surveyed and all information about wildlife species (presence) especially the large terrestrial mammals has been recorded to determine the species concerned. The habitat types and human activities in and around each study site were also noted to formulate a better wildlife management plan in the future.

### **2.2 Night Spotting**

The activities are used to collect information (presence and distribution) on wildlife species that are mostly active at night along the roadsides. But, the activities depend on the road network available within the SFM project areas. Three observation routes were established during the survey. At least four people were required (one (1) driver, one (1) recorder / photographer and two (2) spotters sitting at the back of the truck with two (2) spot-lights to detect wildlife signs along the roadside, maximum speed is 20 km/h and started around 7pm–10pm. Every time wildlife was spotted, the car would stop for species identification and for collecting ancillary information (etc numbers of animals, behavior upon detection, times and distance). All wildlife signs detected will be analyzed by using a linear kilometer index (number of sightings/km).

### **2.3 Morning Drive**

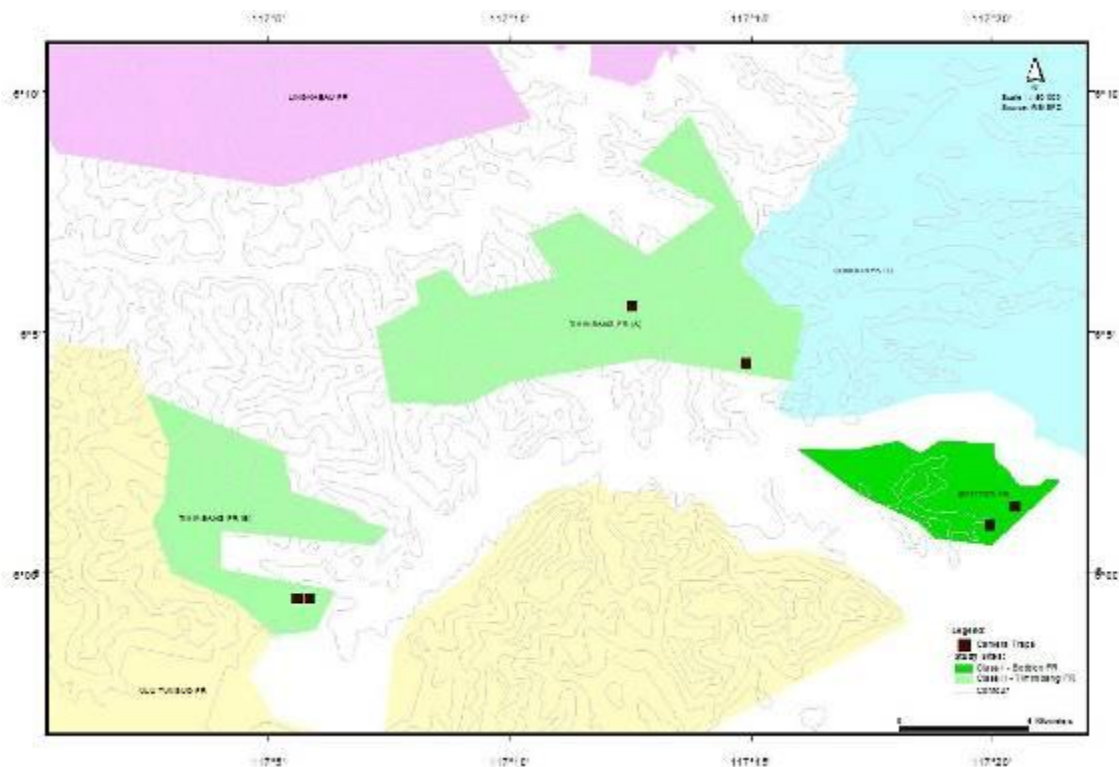
To collect information (presence and distribution) on wildlife species that are mostly active during the daytimes (diurnal species). Based on the road network available within the SFM project areas, the team established only one observation route in Timimbang forest reserve (part A). Four people were required (one (1) driver, one (1) recorder / photographer and two (2) observers sitting at the back of the truck, maximum speed is 20 km/h and started around 6am–10am. Any wildlife spotted, the car would stop for species identification and for collecting ancillary information (etc numbers of animals, behavior upon detection, times and distance). All wildlife signs detected will be analyzed by using a linear kilometer index (number of sightings/km).



## 2.4 Camera Trapping

Useful method and quite accepted to study wildlife presence over the large survey areas in certain time periods. In total, seven (7) units camera traps devices being placed in three different sites which three (3) units situated in Timimbang forest reserve (part B), two (2) units in Timimbang forest reserve (part A) and another two (2) units located within Botitian forest reserve. Purposely, to obtain information on wildlife presence within the SFM project area. The devices located and recorded by using GPS (60CSx) and set the camera on a tree which approximately 50cm above the ground. Each camera traps also installed face to open ground which purposely to avoiding from any intrusive large trees and bushes. The devices been installed only fourteen (14) days, using PC800 HYPERFIRE professional camera trap (Reconxy). Wildlife trail, ridge, wallows and ex-logging road are significant information and criteria should be considered when setting up the camera traps.

**Map 2:** The camera traps distributions that been installed between three different sites in Sustainable Forest Management Project Areas Timimbang-Botitian forest reserve



## 2.5 Interviews

Direct and indirect interviews with senior rangers, forester and others field staff's those working in SFM Timimbang-Botitian FR. The interview survey can be used to better understand the attitude of field staff's toward wildlife species presence and threats of certain species in SFM project areas. Some potential biases will be occur which firstly the interviewees delivered wrong information and secondly misidentification of wildlife species. But based on the experience of SFD field staff's, I believed that all the information provided in relation to the presence of large terrestrial mammals species and birds (mainly hornbill species) in SFM project areas Timimbang-Botitian forest reserve very useful and helping us in order to listing the existed species.

## 2.6 Opportunistic Sighting

All wildlife signs especially large mammals species and bird (hornbill species) either direct or indirect found during the rapid wildlife assessment should be recorded and every information entered into the incidental record sheets. The raw data should be weighted with the survey effort (etc frequency and time spent in the forest) and the type of field activities undertaken in order to obtain the applicable index for presence and information on large terrestrial mammals and birds (in particular hornbill species) within the SFM project areas Timimbang-Botitian forest reserve. The following information need to be recorded on daily basis:

- Date, time, duration and type of field activities
- Location of field work (etc compartment or block)

## 3.0 RESULT

### 3.1 Mammals

In general, at least 18 large terrestrial mammals species from twelve (12) different families were detected during the rapid survey and assessment in SFM Timimbang-Botitian forest reserve. There are three (3) species were classified as schedule I (totally protected, namely Clouded leopard, Sun bear and Asian elephant), 11 species known as schedule II (protected species-limited hunting with license) and 4 species inclusive as schedule III (protected species-hunting with license) under Wildlife Conservation Enactment 1997. Most of the large mammals detected and recorded which 55.56 percent (*species, n=10*) are classified as threatened species and 38.89 percent (*species, n=7*) least concern in IUCN red list. The Bearded pig and Sambar deer were found in all the three studies sites, Bornean gibbons *Hylobates muelleri* were detected only in Timimbang forest reserve (both part A and B). The most and common species detected was the *Sus barbatus* with a percentage of 43.48 per cent while amongst the least detected which 2.17per cent were *Neofelis nebolusa*, *Arctictis binturong*, *Macaca fascicularis* and *Mydaus javanensis*.

There is no direct Orang-utan or nest sighted for the period of wildlife survey conducted between three different sites in SFM project areas. However, according to staff working in Timimbang-Botitian (Mr. Rozaimie Ahmad) he had once experience that encountered with an Orang-utan walked on the ground somewhere within Timimbang forest reserve in year 2007. I believed this information is significant as evidence of the Orang-utan which was last recorded in SFM Timimbang-Botitian project areas. Besides, there is no gibbon sighted or call was heard during the rapid wildlife assessment in Botitian forest reserve, but according to the senior rangers which base in Botitian station sometimes they heard the sound of gibbon calling. In fact, if a few gibbons are still roaming within Botitian forest reserve but they are completely isolated from other forest and it was the main threat to long term survival.

At least five (5) primate species were detected and recorded during the rapid survey in May 2014, four (4) species that were sighted known as diurnal which two (2) species of macaque (*Macaca fascicularis* and *Macaca nemestrina*) which found in all study sites, Bornean gibbon (*Hylobates muelleri*) sighted and call was heard only in Timimbang FR (both part A and B), Maroon langur or Red leaf monkey (*Presbytis rubicund*) sighted in Timimbang FR (part A) and one species of nocturnal primate namely

Slow loris (*Nycticebus coucang*) detected in Botitian FR. Based on current survey, primates diversity and abundance within Botitian FR poorly represented against to Timimbang FR.

Based on the short time period, every single species detected during the rapid assessment in May 2014 were recorded and compiled, by guided the previous studies (Ancrenaz, 2008) and direct interviews with seniors' rangers and forester those working in Timimbang-Botitian project areas some information gathered in relation to the presence of large terrestrial mammals species diversity existed in SFM Timimbang-Botitian forest reserve. As a result of information obtained, a total of 37 species from 17 families of large terrestrial mammals were identified and known existed in SFM Timimbang-Botitian project areas (see table 8), approximately 40.5 percent ( $n=15$ ) which almost partly of the large terrestrial mammals species listed were classified as threatened species in IUCN red list. This is significant information that presented SFM Timimbang-Botitian project area that should be considered and gives attention in order to realize the forest certification criteria and requirements to establishment SFM.

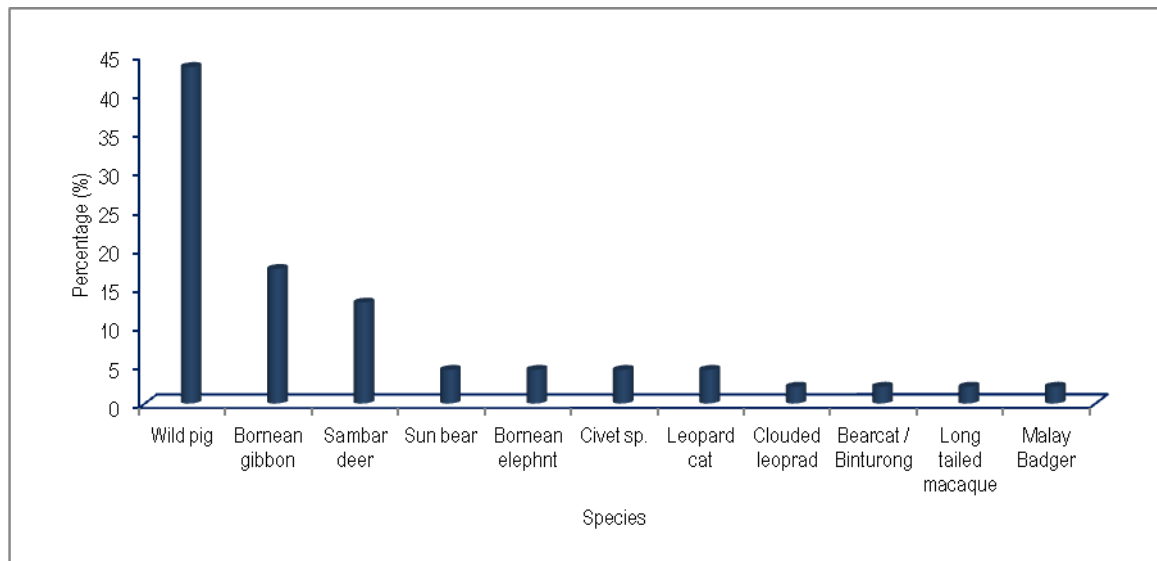
In term of species detection per km, again the *Sus barbatus* presented the highest index (3.57) as compared to other species detected throughout the survey period in SFM project areas (see table 2 & figure 2), other species that have shown relatively high index of detection were Bornean gibbon (*Hylobates muelleri*, 1.43) and the Sambar deer (*Cervus unicolor*, 1.07). Based on the linear kilometric indexes (table 4), Timimbang forest reserve part B has recorded the highest species diversity index which 4.50 signs detected per kilometers, followed by Timimbang forest reserve part A 2.94 signs detected per kilometers and the lowest species diversity index among the large mammal species encountered was in Botitian forest reserve which only 1.05 per kilometer.

**Table 1:** Total number of large mammal species detected through wildlife survey (recce walks) between three different sites in SFM project areas Timimbang-Botitian forest reserve. **BFR** = Botitian FR, **TP (A)** = Timimbang Part A, **TP (B)** = Timimbang Part B

No	Common Name	Scientific Name	Family	BFR	TP (A)	TP (B)	Total	(%)
1	Bearded pig	<i>Sus barbatus</i>	Suidae	4	5	11	20	43.48
2	Sambar deer	<i>Cervus unicolor</i>	Cervidae	2	1	3	6	13.04
3	Bornean gibbon	<i>Hylobates muelleri</i>	Hylobatidae	0	4	4	8	17.39
4	Clouded leopard	<i>Neofelis nebulosa</i>	Felidae	0	1	0	1	2.17
5	Sun bear	<i>Helarctos malayanus</i>	Canidae	0	2	0	2	4.35
6	Bearcat / Binturong	<i>Arctictis binturong</i>	Viverridae	0	0	1	1	2.17
7	Bornean elephant	<i>Elephas maximus</i>	Elephantidae	0	0	2	2	4.35
8	Civet sp.		Viverridae	0	0	2	2	4.35
9	Leopard cat	<i>Prionailurus bengalensis</i>	Felidae	0	0	2	2	4.35
10	Long tailed macaque	<i>Macaca fascicularis</i>	Cercopithecidae	0	0	1	1	2.17
11	Malay Badger	<i>Mydaus javanensis</i>	Mustelidae	0	0	1	1	2.17

**Total      46**

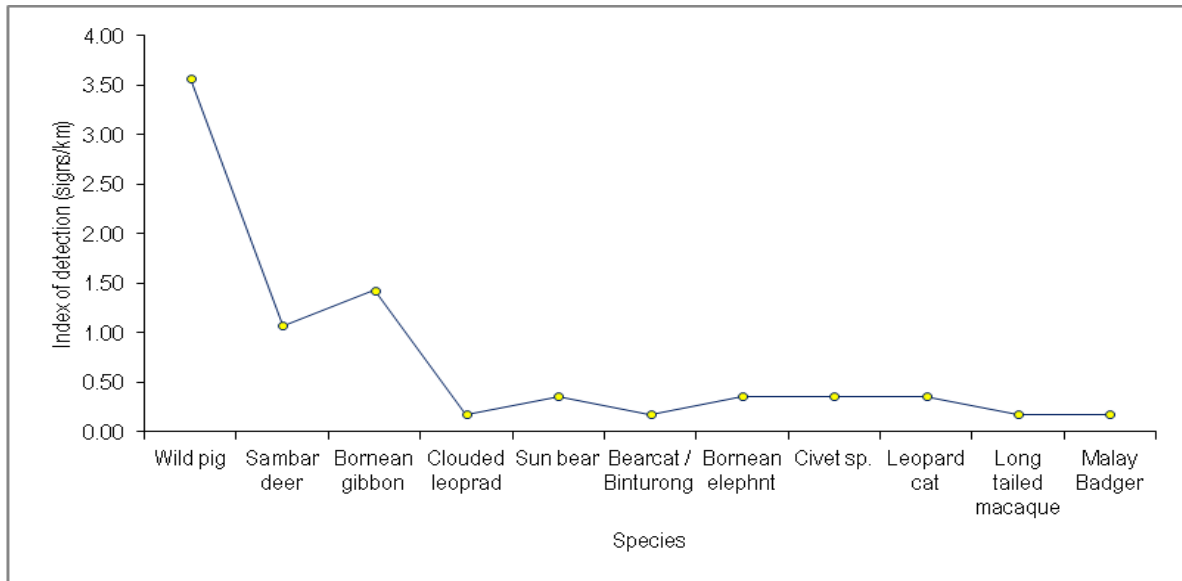
**Figure 1:** Percentage (%) of large terrestrial mammal species detected through recce walked between three different sites in SFM project areas Timimbang – Botitian forest reserve



**Table 2:** Relative indices of large mammals detected per kilometer for the period of recce walked in Sustainable Forest Management project area Timimbang – Botitian Forest Reserve (no. of species evidence detection /km),  $\Sigma$  distance covered = 5.6km.

No	Common Name	Botitian FR	Tim. FR (Part A)	Tim. FR (Part B)	Total	Index/KM
1	Wild pig	4	5	11	20	3.57
2	Sambar deer	2	1	3	6	1.07
3	Bornean gibbon	0	4	4	8	1.43
4	Clouded leopard	0	1	0	1	0.18
5	Sun bear	0	2	0	2	0.36
6	Bearcat / Binturong	0	0	1	1	0.18
7	Bornean elephant	0	0	2	2	0.36
8	Civet sp.	0	0	2	2	0.36
9	Leopard cat	0	0	2	2	0.36
10	Long tailed macaque	0	0	1	1	0.18
11	Malay Badger	0	0	1	1	0.18

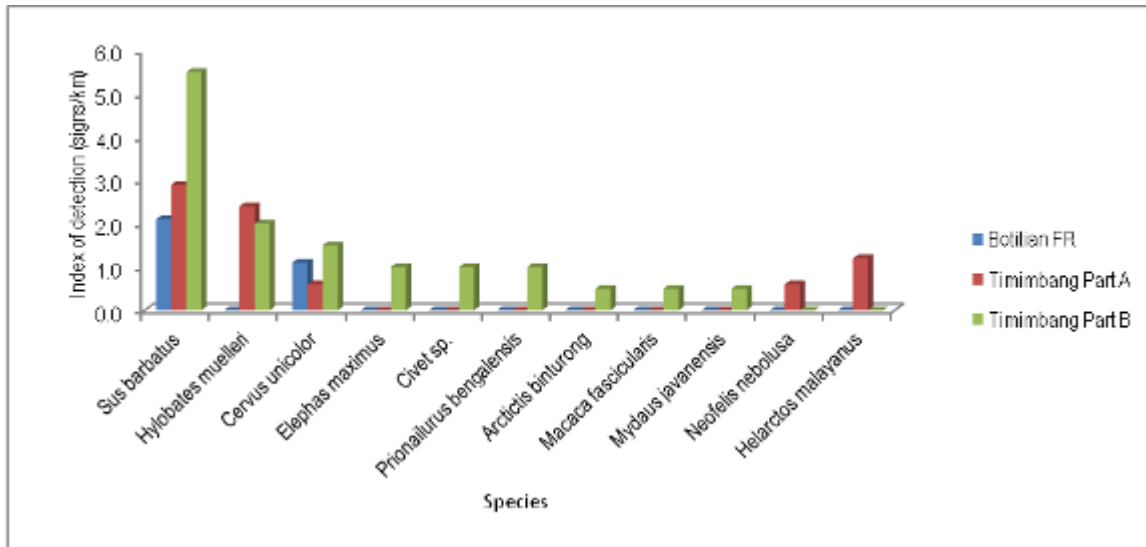
**Figure 2:** Diversity index of large terrestrial mammal species detection within Sustainable Forest Management project areas Timimbang – Botitian forest ferve



**Table 3:** Index of large mammals detected per km for the period of recce walked between three (3) different sites in SFM project area Timimbang – Botitian Forest Reserve (no. of species/km),  $\Sigma$  distance covered Botitian (BFR) = 1.9km, Timimbang Part A (TPA) = 1.7 & Timimbang Part B (TPB) = 2km

No	Common Name	Scientific Name	Family	BFR	TP (A)	TP (B)
1	Bearded pig	<i>Sus barbatus</i>	<b>Suidae</b>	2.1	2.9	5.5
2	Sambar deer	<i>Cervus unicolor</i>	<b>Cervidae</b>	1.1	0.6	1.5
3	Bornean gibbon	<i>Hylobates muelleri</i>	<b>Hylobatidae</b>	0	2.4	2
4	Clouded leopard	<i>Neofelis nebulosa</i>	<b>Felidae</b>	0	0.6	0
5	Sun bear	<i>Helarctos malayanus</i>	<b>Canidae</b>	0	1.2	0
6	Bearcat / Binturong	<i>Arctictis binturong</i>	<b>Viverridae</b>	0	0	0.5
7	Bornean elephant	<i>Elephas maximus</i>	<b>Elephantidae</b>	0	0	1
8	Civet sp.		<b>Viverridae</b>	0	0	1
9	Leopard cat	<i>Prionailurus bengalensis</i>	<b>Felidae</b>	0	0	1
10	Long tailed macaque	<i>Macaca fascicularis</i>	<b>Cercopithecidae</b>	0	0	0.5
11	Malay Badger	<i>Mydaus javanensis</i>	<b>Mustelidae</b>	0	0	0.5

**Figure 3:** The comparison of large mammal detected between three (3) different sites in SFM Timimbang-Botitian Forest Reserve



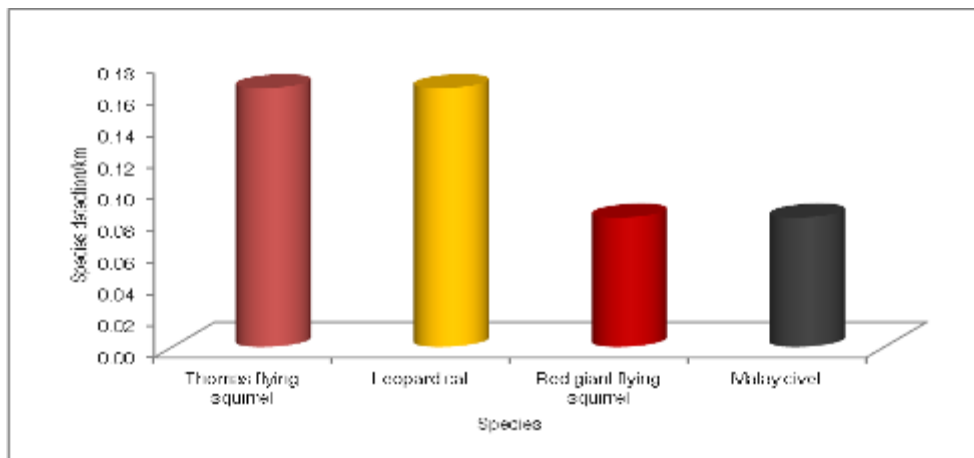
**Table 4:** Comparison of species diversity indices for large mammals between three different study sites in SFM project area Timimbang – Botitian Forest Reserve (no. of species detected / kilometer),  $\Sigma$ distance covered Botitian (BFR) = 1.9km, Timimbang Part A (TPA) = 1.7 & Timimbang Part B (TPB) = 2km

Study sites	Botitian FR	Timimbang FR Part A	Timimbang FR Part B
No. of Species detection	2	5	9
Index / KM	1.05	2.94	4.50

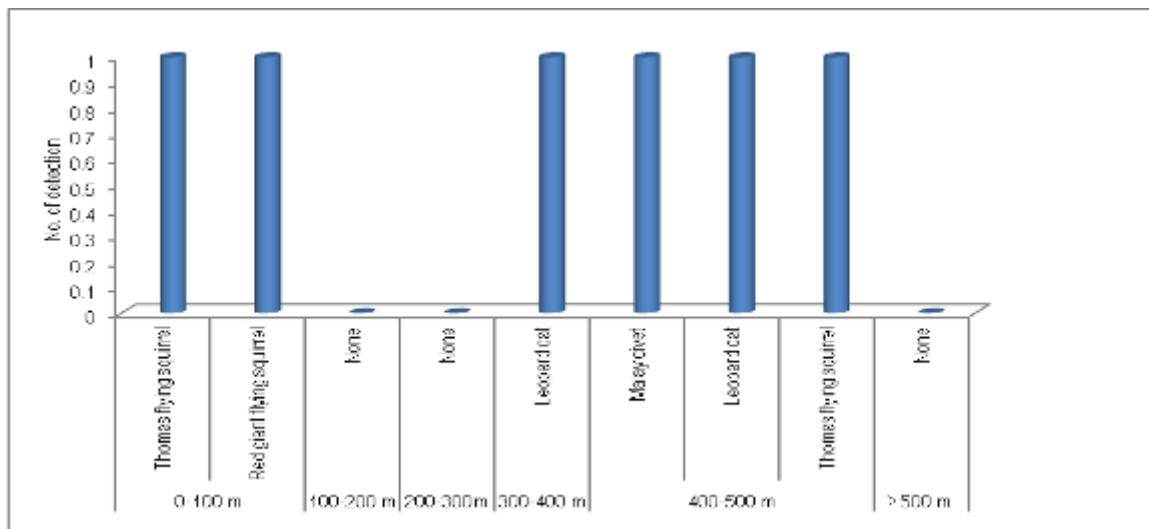
**Table 5:** Large terrestrial mammals indices of nocturnal species detected per kilometer during the night spots within Sustainable Forest Management project areas Timimbang – Botitian Forest Reserve (no. of species detected / kilometer),  $\Sigma$ distance covered = 12.2km

No	Common Name	Botitian FR	Tim. FR (Part A)	Tim. FR (Part B)	Total	Index/KM
1	Thomas flying squirrel	1	1	0	2	0.16
2	Red giant flying squirrel	1	0	0	1	0.08
3	Leopard cat	0	2	0	2	0.16
4	Malay civet	0	1	0	1	0.08

**Figure 4:** A total of species indices detected per kilometer for the period of night spot conducted in SFM project area Timimbang-Botitan forest reserve. Thomas flying squirrel and Leopard cat are two (2) species were most frequently detected



**Figure 5:** Shown the wildlife species found in SFM project area Timimbang-Botitan forest reserve based on six (6) ranging elevation (0m-100m, 100m-200m, 200m-300m, 300m-400m, 400m-500m and more than 500m). Most of the large mammals species were detected in altitude between 300 meters – 500 meters and altitude at 0 meter to 100 meters, as the graph presented only six (6) nocturnal species were detected during the survey



**Table 6:** Indices of large terrestrial mammals and birds (big species) detected during the morning drive conducted within Timimbang forest reserve part A. Bornean gibbon known as large mammals that been recorded quite often into this area

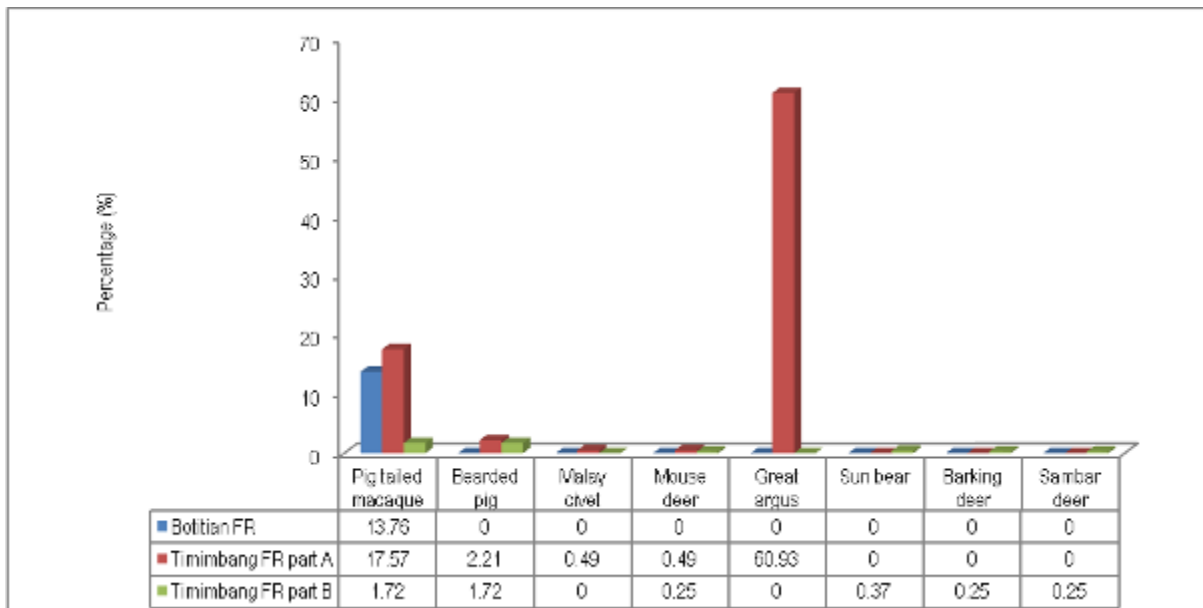
Common Species	No. of sign detection	Index (no. of detection/km)
Great argus	6	0.69
Rhinoceros hornbill	4	0.46
Bornean gibbon	3	0.34
Crested serpent eagle	2	0.23
Wild pig	2	0.23
Barking deer	1	0.11
Red leaf monkey or Maroon langur	1	0.11
Wreathed hornbill	1	0.11

**Table 7:** Total of wildlife species that been photographed by using camera traps devices between three different study sites in Sustainable Forest Management project areas Timimbang-Botitian forest reserve

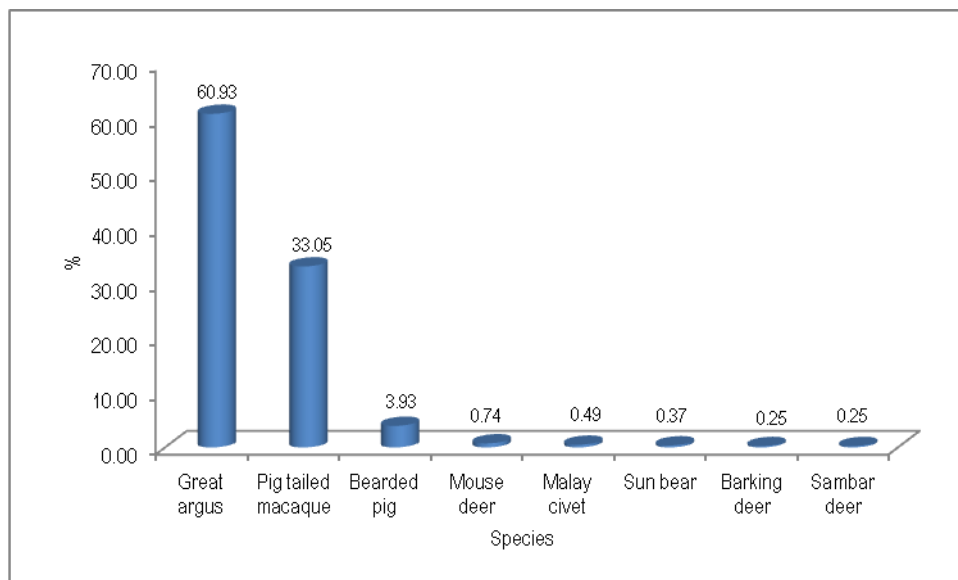
Study Sites	Wildlife Species	No. of Images	Percentage %
Botitian FR	Pig tailed macaque	112	13.76
Timimbang FR part A	Bearded pig	18	2.21
	Malay civet	4	0.49
	Mouse deer	4	0.49
	Great argus	496	60.93
	Pig tailed macaque	143	17.57
	Timimbang FR part B	Pig tailed macaque	14
Sun bear		3	0.37
Wild pig		14	1.72
Barking deer		2	0.25
Mouse deer		2	0.25
Sambar deer		2	0.25
<b>Total</b>			<b>814</b>



**Figure 6:** Comparison of wildlife images photographed by using camera trapping devices between three different study sites within SFM project area Timimbang-Botitian forest reserve. Pig tailed macaque been detected in all over the sites and it was presented that the species well distributed



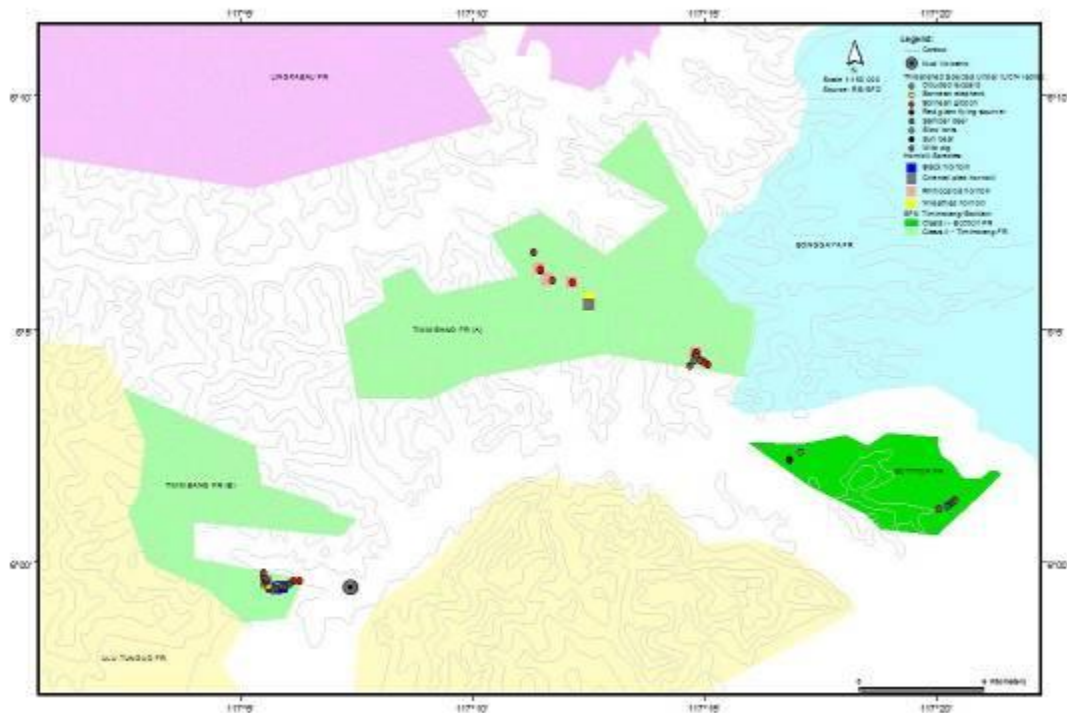
**Figure 7:** The wildlife species images were photographed by using camera trapping devices within SFM project area Timimbang-Botitian forest reserve. Pig tailed macaque been detected in all over the sites and well distributed



**Table 8:** A list and status on IUCN red list of large terrestrial mammals species detected during the rapid wildlife survey and assessment in SFM project areas Timimbang-Botitian forest reserve

No	Common Name	Scientific Name	Family	WCE [SWD]	IUCN redlist
1	Asian elephant	<i>Elephas maximus</i>	Elephantidae	I	Endangered
2	Barking deer	<i>Muntiacus muntjac</i>	Cervidae	III	Least concern
3	Bearded pig	<i>Sus barbatus</i>	Suidae	III	Vulnerable
4	Binturong/Bearcat	<i>Arctictis binturong</i>	Viverridae	II	Vulnerable
5	Bornean gibbon	<i>Hylobates muelleri</i>	Hylobatidae	II	Endangered
6	Clouded leopard	<i>Neofelis nebulosa</i>	Felidae	I	Vulnerable
7	Greater Mouse deer	<i>Tragulus napu</i>	Tragulidae	III	Least concern
8	Leopard cat	<i>Prionailurus bengalensis</i>	Felidae	II	Least concern
9	Long-tailed macaque	<i>Macaca fascicularis</i>	Cercopithecidae	II	Least concern
10	Malay badger	<i>Mydaus javanensis</i>	Mustelidae	II	Least concern
11	Malay civet	<i>Viverra zangalunga</i>	Viverridae	II	Least concern
12	Maroon langur or Red leaf monkey	<i>Presbytis rubicunda</i>	Cercopithecidae	II	Least concern
13	Pig-tailed macaque	<i>Macaca nemestrina</i>	Cercopithecidae	II	Vulnerable
14	Red giant flying squirrel	<i>Petaurista petaurista</i>	Petauristinae	II	Vulnerable
15	Sambar deer	<i>Cervus unicolor</i>	Cervidae	III	Vulnerable
16	Slow loris	<i>Nycticebus coucang</i>	Lorisidae	II	Vulnerable
17	Sun bear	<i>Helarctos malayanus</i>	Canidae	I	Vulnerable
18	Thomas flying squirrel	<i>Aeromys thomasi</i>	Petauristinae	II	Data Deficient

**Map 3:** Distribution of large terrestrial mammals species that were classified as a threatened species under IUCN red list, the species were detected and recorded during the rapid survey in May 2014

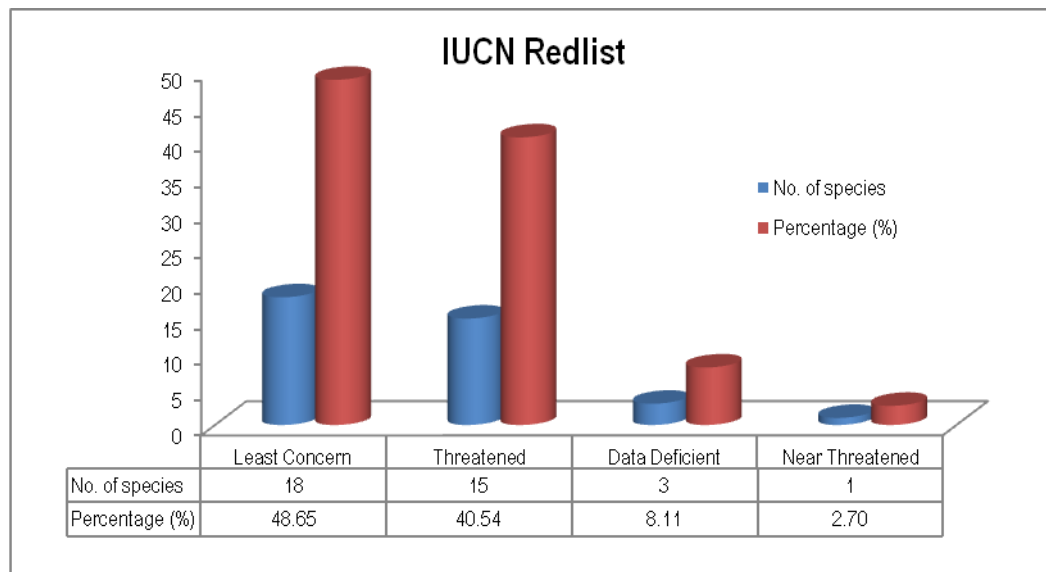


**Table 9:** The compilation of large terrestrial mammals species those are available in SFM project area Timimbang-Botitian forest reserve, the information is based on current survey, previous studies by Ancrenaz (2008) and direct interviews with the senior rangers and forester those base in Timimbang-Botitan

No	Common name	Scientific Name	Family	WCE [SWD]	IUCN redlist	Comments [Recorder, location etc]
1	Banded linsang	<i>Prionodon linsang</i>	<b>Viverridae</b>	II	LC	SFD, interviews
2	Banded palm civet	<i>Hemigalus derbyanus</i>	<b>Viverridae</b>	II	V	SFD, interviews
3	Bearded pig	<i>Sus barbatus</i>	<b>Suidae</b>	III	V	SFD, May 2014 survey, common at all sites
4	Binturong/Bearcat	<i>Arctictis binturong</i>	<b>Viverridae</b>	II	V	SFD, interviews, May 2014 Timimbang B, HUTAN (2007 wildlife survey)
5	Bornean gibbon	<i>Hylobates muelleri</i>	<b>Hylobatidae</b>	II	E	SFD May 2014 survey Timimbang (A&B), Botitian (interview)
6	Bornean red muntjac (Barking deer)	<i>Muntiacus muntjac</i>	<b>Cervidae</b>	III	LC	SFD, interviews
7	Bornean yellow muntjac (Barking deer)	<i>Muntiacus atherodes</i>	<b>Cervide</b>	III	LC	SFD, interviews
8	Rajah spiny Rat (Rajah sundaic maxomys)	<i>Maxomys rajah</i>	<b>Muridae</b>	II	V	HUTAN, 2007 wildlife survey
9	Clouded leopard	<i>Neofelis nebulosa</i>	<b>Felidae</b>	I	V	SFD Tim-Boti interviews, May 2014 survey Timimbang A
10	Common palm civet	<i>Paradoxurus hermaphroditus</i>	<b>Viverridae</b>	II	LC	SFD, interviews
11	Common porcupine	<i>Hystrix brachyuran</i>	<b>Hystriidae</b>	III	LC	SFD, interviews
12	Common tree shrew	<i>Tupaia glis</i>	<b>Tupaiaidae</b>	II	LC	HUTAN, 2007 wildlife survey
13	Dark tailed tree rat	<i>Niviventer cremoriventer</i>	<b>Muridae</b>	II	V	HUTAN, 2007 wildlife survey
14	Greater mouse deer	<i>Tragulus napu</i>	<b>Tragulidae</b>	III	LC	HUTAN, 2007 wildlife survey, SFD interviews, May 2014 (Timimbang A&B)
15	Horsfield's tarsier	<i>Tarsius bancanus</i>	<b>Tarsiidae</b>	II	V	SFD, interviews
16	Large tree shrew	<i>Tupaia tana</i>	<b>Tupaiaidae</b>	II	LC	HUTAN, 2007 wildlife survey
17	Leopard cat	<i>Prionailurus bengalensis</i>	<b>Felidae</b>	II	LC	SFD, interviews
18	Lesser mouse deer	<i>Tragulus javanicus</i>	<b>Tragulidae</b>	III	DD	SFD, interviews
19	Long-tailed macaque	<i>Macaca fascicularis</i>	<b>Cercopithecidae</b>	II	LC	HUTAN 2007 wildlife survey, SFD May 2014 survey
20	Low's squirrel	<i>Sundasciurus lowii</i>	<b>Sciuridae</b>	II	LC	HUTAN, 2007 wildlife survey
21	Malay badger	<i>Mydaus javanensis</i>	<b>Mustelidae</b>	II	LC	SFD interview, May 2014 survey (Tim B)

22	Malay civet	<i>Viverra zangalunga</i>	<b>Viverridae</b>	II	LC	SFD interviews, May 2014 survey (Tim A)
23	Maroon langur or Red leaf monkey	<i>Presbytis rubicund</i>	<b>Cercopithecidae</b>	II	LC	HUTAN 2007 wildlife survey, SFD May 2014
24	Müller's sundamys (Müller's giant sunda rat)	<i>Sundamys muelleri</i>	<b>Muridae</b>	II	LC	HUTAN 2007 wildlife survey
25	Orang utan	<i>Pongo pygmaeus</i>	<b>Pongidae</b>	I	E	Staff Timimbang-Botitian (2007), walk on the ground (Timimbang A)
26	Pale giant squirrel	<i>Ratufa affinis</i>	<b>Sciuridae</b>	II	NT	HUTAN 2007 wildlife survey
27	Pig-tailed macaque	<i>Macaca nemestrina</i>	<b>Cercopithecidae</b>	II	V	HUTAN 2007 wildlife survey, SFD May 2014
28	Plain pigmy squirrel (Least pygmy squirrel)	<i>Exilisciurus exilis</i>	<b>Sciuridae</b>	II	DD	HUTAN 2007 wildlife survey
29	Plantain squirrel	<i>Callosciurus notatus</i>	<b>Sciuridae</b>	II	LC	HUTAN 2007 wildlife survey
30	Prevost's Squirrel	<i>Callosciurus prevostii</i>	<b>Sciurinae</b>	II	LC	HUTAN 2007 wildlife survey
31	Red giant flying squirrel	<i>Petaurista petaurista</i>	<b>Petauristinae</b>	II	V	SFD May 2014 survey
32	Sambar deer	<i>Cervus unicolor</i>	<b>Cervidae</b>	III	V	HUTAN 2007 wildlife survey, SFD May 2014
33	Slow loris	<i>Nycticebus coucang</i>	<b>Lorisidae</b>	II	V	SFD, May survey 2014
34	Small spiny rat	<i>Rattus steini</i>	<b>Muridae</b>	II	LC	HUTAN, 2007 wildlife survey
35	Sun bear	<i>Helarctos malayanus</i>	<b>Canidae</b>	I	V	SFD, May survey 2014
36	Thomas flying squirrel	<i>Aeromys thomasi</i>	<b>Petauristinae</b>	II	DD	SFD, May survey 2014
37	Whitehead rat (Whitehead's Sundaic Maxomys or Whitehead's Spiny Rat))	<i>Maxomys whiteheadi</i>	<b>Muridae</b>	II	V	HUTAN, 2007 wildlife survey

**Figure 8:** The classification of terrestrial mammal's species under IUCN red list that known and recognized existed within the Sustainable Forest Management project areas in Timimbang-Botitian Forest Reserve



### 3.2 Birds

The bird's surveys were conducted between three (3) different sites in SFM project areas (Timimbang – Botitian Forest Reserve) namely Botitian FR, Timimbang FR part A and Timimbang FR part B. The surveillance sites been selected randomly, and during the rapid assessment we were completed to set-up at least nine (9) birds observation spots within the project areas (refer to map 3). The observation started from 6:30am to 10:00am and all birds' species that were detected and identified been recorded. Direct and indirect sighting (etc vocalizing or sound) through the transect is the foremost methods that we were used for this activities. All birds that been recorded in SFM project areas Timimbang – Botitian forest reserve were identified by Mr. Yoktan Julbit and compile by myself.

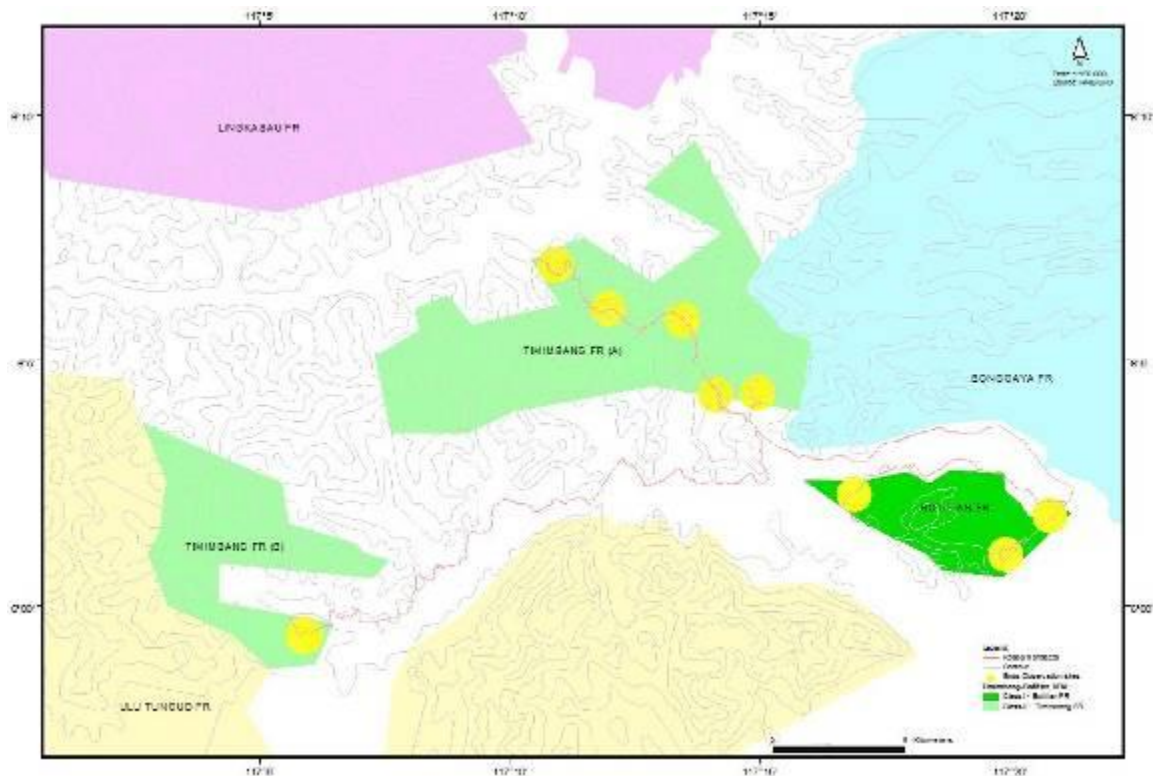
Overall, more than 160 species of birds from 38 families (see table 7) were recorded throughout this rapid survey which 44 (27.3 percent) species of birds that are classified as Near Threatened (NT) and 3 (1.9 percent) species are classified as Vulnerable (V) in IUCN red list were found and recorded within the SFM project areas. There rest of the species been recorded are mainly classified as Least Concern (LC) which consist to 113 (70.2 percent) under the IUCN red list. The birds' population was more diverse in Timimbang FR part A and followed by Botitan FR, opening up of forested areas nearby the forest reserve to plantations could be given way to new communities of birds that occur in particular area.

144 species of birds from 37 families were recorded within and adjacent to Botitian forest reserve (see table 8). Of those, three (3) species are classified as vulnerable and 38 species neat threatened in IUCN red list, others species are known and classified as least concern. There is four (4) hornbill species were recorded into this project area such White crowned hornill *Aceros comatus*, Asian black hornbill *Anthracoceros malayanus*, Rhinoceros hornbill *Buceros rhinoceros* and Helmeted hornbill *Buceros vigil*.

All hornbill species that been recorded known as near threatened under IUCN red list and can be treated as part of the threatened category.

Timimbang forest reserve part A reported to have at least 158 species from 38 family (see table 9), among the birds species recorded, only 3 species are classified as vulnerable and 44 species near threatened. This area was found to have the highest number of birds species variation compare to the Timimbang forest reserve part B which is only 123 species (see table 10). At least seven (7) hornbill species namely *Anorrhinus galeritus*, *Anthracoceros albirostris*, *Aceros undulatus*, *Anthracoceros malayanus*, *Buceros vigil*, *Buceros rhinoceros* and *Aceros comatus* been recorded in Timimbang part A while only 4 species recorded in Timimbang part B.

**Map 4:** Location of the bird's observation sites in SFM project areas



**Table 10:** List of birds species found and recorded during the rapid wildlife survey and assessment within Sustainable Forest Management project areas Timimbang – Botitian Forest Reserve

No	Common Name	Scientific Name	Family	Comment / Status	IUCN Red List
1	Asian black hornbill	<i>Anthracoceros malayanus</i>	<b>Bucerotidae</b>	Common resident	NT
2	Asian fairy bluebird	<i>Irena puella</i>	<b>Oriolidae</b>	Common resident	LC
3	Asian glossy starling	<i>Aplonis panayensis</i>	<b>Sturnidae</b>	Abundant resident	LC
4	Asian palm swift	<i>Cypsiurus balasiensis</i>	<b>Apodidae</b>	local resident	LC
5	Asian paradise flycatcher	<i>Terpsiphone paradise</i>	<b>Monarchidae</b>	Common resident	LC
6	Banded bay cuckoo	<i>Cacomantis sonneratii</i>	<b>Cuculidae</b>	Common resident	LC
7	Banded broadbill	<i>Eurylaimus javanicus</i>	<b>Eurylaimidae</b>	Common resident	LC
8	Banded woodpecker	<i>Picus mineaceus</i>	<b>Picidae</b>	Common resident	LC
9	Bar winged flycatcher shrike	<i>Hemipus picatus</i>	<b>Campephagidae</b>	Common resident	LC

10	Barn owl	<i>Tyto alba</i>	<b>Strigidae</b>	local resident	LC
11	Barred eagle owl	<i>Bubo sumatranus</i>	<b>Strigidae</b>	Scare resident	LC
12	Bat hawk	<i>Machaeramphus alcinus</i>	<b>Accipitridae</b>	local resident	LC
13	Black and yellow broadbill	<i>Eurylaimus ochromalus</i>	<b>Eurylaimidae</b>	Common resident	NT
14	Black backed kingfisher	<i>Ceyx erithaca</i>	<b>Alcedinidae</b>	possible vagrant	LC
15	Black bellied malkoha	<i>Phaenicophaeus diardi</i>	<b>Cuculidae</b>	local resident	NT
16	Black capped babbler	<i>Pellorneum capistratum</i>	<b>Timaliidae</b>	Common resident	LC
17	Black headed bulbul	<i>Pycnonotus atriceps</i>	<b>Pycnonotidae</b>	Common resident	LC
18	Black headed pitta	<i>Pitta ussherri</i>	<b>Pittidae</b>		NT
19	Black magpie	<i>Platysmurus leucopterus</i>	<b>Corvidae</b>		NT
20	Black naped monarch	<i>Hypothymis azurea</i>	<b>Monarchidae</b>	Common resident	LC
21	Black throated babbler	<i>Stachyris nigricollis</i>	<b>Timaliidae</b>	Common resident	NT
22	Black winged flycatcher shrike	<i>Hemipus hirundinaceus</i>	<b>Campephagidae</b>	local resident	LC
23	Blue Crowned Hanging Parrot	<i>Loriculus galgulus</i>	<b>Psittacidae</b>	Common resident	LC
24	Blue Eared Barbet	<i>Megalaima australis</i>	<b>Ramphastidae</b>	Common resident	LC
25	Blue Headed Pitta	<i>Pitta baudii</i>	<b>Pittidae</b>	common and endemic in Borneo	VU
26	Blue Rumped Parrot	<i>Psittinus cyanurus</i>	<b>Psittacidae</b>	local resident	NT
27	Blue Throated Bee-Eater	<i>Merops viridis</i>	<b>Meropidae</b>	common nomadic resident	LC
28	Blyth's hawk eagle	<i>Nisaetus alboniger</i>	<b>Accipitridae</b>	Scare resident	LC
29	Bronzed drongo	<i>Dicrurus aeneus</i>	<b>Dicruridae</b>	Common resident	LC
30	Brown barbet	<i>Calorhamphus fuliginosus</i>	<b>Ramphastidae</b>	Common resident	LC
31	Brown fulvetta	<i>Alcippe brunneicauda</i>	<b>Timaliidae</b>	local resident	NT
32	Brown wood owl	<i>Strix leptogrammica</i>	<b>Strigidae</b>	local resident	LC
33	Buff vented bulbul	<i>Iole olivacea</i>	<b>Pycnonotidae</b>	Scare resident	LC
34	Buffy Fish Owl	<i>Ketupa ketupu</i>	<b>Strigidae</b>	Common resident	LC
35	Bushy Crested Hornbill	<i>Anorrhinus galeritus</i>	<b>Bucerotidae</b>	Common resident	LC
36	Cattle Egret	<i>Bubulcus ibis</i>	<b>Ardeidae</b>	migrant	LC
37	Changeable hawk eagle	<i>Nisaetus cirrhatus</i>	<b>Accipitridae</b>	Scare resident	LC
38	Chestnut Backed Scimitar Babbler	<i>Pomatorhinus montanus</i>	<b>Timaliidae</b>	Scare resident	LC
39	Chestnut Bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	<b>Cuculidae</b>	local resident	NT
40	Chestnut Breasted Malkoha	<i>Phaenicophaeus curvirostris</i>	<b>Cuculidae</b>	Common resident	LC
41	Chestnut Munia	<i>Lonchura atricapilla</i>	<b>Estrildidae</b>	Common resident	LC
42	Chestnut Naped Forktail	<i>Enicurus ruficapillus</i>	<b>Turdidae</b>	local resident	NT
43	Chestnut necklaced hill partridge (Scaly	<i>Arborophila chloropus</i>	<b>Phasianidae</b>	Common resident	LC

	breasted partridge)				
44	Chestnut Rumped Babbler	<i>Stachyris maculate</i>	<b>Timaliidae</b>	Common resident	NT
45	Chestnut Winged Babbler	<i>Stachyris erythroptera</i>	<b>Timaliidae</b>	Common resident	LC
46	Common Iora	<i>Aegithina tiphia</i>	<b>Aegithinidae</b>	Common resident	LC
47	Common Sandpiper	<i>Actitis hypoleucos</i>	<b>Scolipacidae</b>	Common winter visitor	LC
48	Cream Vented Bulbul	<i>Pycnonotus simplex</i>	<b>Pycnonotidae</b>	Common resident	LC
49	Crested Fireback	<i>Lophura ignita</i>	<b>Phasianidae</b>	local resident	NT
50	Crested Goshawk	<i>Accipiter trivirgatus</i>	<b>Falconidae</b>	local resident	LC
51	Crested Jay	<i>Platylophus galericulatus</i>	<b>Corvidae</b>	Common resident	NT
52	Crested Serpent Eagle	<i>Spilornis cheela</i>	<b>Accipitridae</b>	Common resident	LC
53	Crimson Winged Woodpecker	<i>picus puniceus</i>	<b>Picidae</b>	Scarcely resident	LC
54	Dark Throated Oriole	<i>Oriolus xanthonotus</i>	<b>Oriolidae</b>	Common resident	NT
55	Diard's Trogon	<i>Harpactes diardii</i>	<b>Trogonidae</b>	lowland resident	NT
56	Dusky Broadbill	<i>Corydon sumatranus</i>	<b>Eurylaimidae</b>	Scarcely resident	LC
57	Dusky Munia	<i>Lonchura fuscans</i>	<b>Estrildidae</b>	common endemic	LC
58	Emerald Dove	<i>Chalcophaps indica</i>	<b>Columbidae</b>	Common nomadic resident	LC
59	Eurasian Tree Sparrow	<i>Passer montanus</i>	<b>Passeridae</b>	Common resident	LC
60	Ferruginous Babbler	<i>Trichastoma bicolor</i>	<b>Timaliidae</b>	local resident	LC
61	Fiery Minivet	<i>Pericrocotus igneus</i>	<b>Campephagidae</b>	local resident	NT
62	Finsch's bulbul	<i>Alophoixus finschii</i>	<b>Pycnonotidae</b>	Scarcely resident	NT
63	Fluffy Backed Tit-Babbler	<i>Macronous ptilosus</i>	<b>Timaliidae</b>	Common resident	NT
64	Glossy Swiftlet	<i>Collocalia esculenta</i>	<b>Apodidae</b>	Common resident	LC
65	Gold-Whiskered Barbet	<i>Megalaima chrysopogon</i>	<b>Ramphastidae</b>	Common resident	LC
66	Great Argus	<i>Argusianus argus</i>	<b>Phasianidae</b>	local resident	NT
67	Greater Coucal	<i>Centropus sinensis</i>	<b>Cuculidae</b>	Common resident	LC
68	Greater Green Leafbird	<i>Chloropsis sonnerati</i>	<b>Aegithinidae</b>	Common resident	LC
69	Greater Racquet Tailed Drongo	<i>Dicrurus paradiseus</i>	<b>Dicruridae</b>	Common resident	LC
70	Green Imperial Pigeon	<i>Ducula aenea</i>	<b>Columbidae</b>	Common resident	LC
71	Green Iora	<i>Aegithina viridissima</i>	<b>Aegithinidae</b>	Common resident	NT
72	Grey And Buff Woodpecker	<i>Hemicircus concretus</i>	<b>Picidae</b>	local resident	LC
73	Grey Capped Woodpecker	<i>Dendrocopos canicapillus</i>	<b>Picidae</b>	local resident	LC
74	Grey Cheeked Bulbul	<i>Alophoixus bres</i>	<b>Pycnonotidae</b>	Common resident	LC
75	Grey Chested Jungle Flycatcher	<i>Rhinomyias umbratilis</i>	<b>Muscicapidae</b>	Common resident	NT
76	Grey Headed Babbler	<i>Stachyris poliocephala</i>	<b>Timaliidae</b>	local resident	LC
77	Grey Rumped Treeswift	<i>Hemiprocne longipennis</i>	<b>Apodidae</b>	Common resident	LC

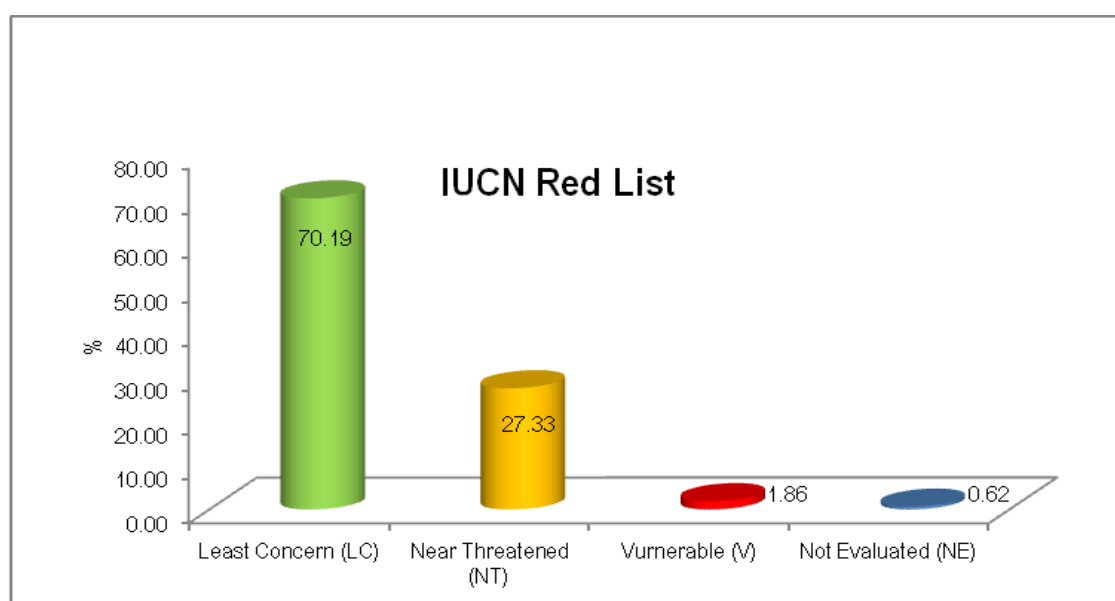


78	Hairy Backed Bulbul	<i>Tricholestes criniger</i>	<b>Pycnonotidae</b>	Common resident	LC
79	Helmeted Hornbill	<i>Buceros vigil</i>	<b>Bucerotidae</b>	Scarce resident, large hornbill	NT
80	Hill Myna	<i>Gracula religiosa</i>	<b>Sturnidae</b>	Common resident	LC
81	Horsfield's Babbler	<i>Malacocincla sepiaria</i>	<b>Timaliidae</b>	local resident	LC
82	House Swift	<i>Apus nipalensis</i>	<b>Apodidae</b>	Common resident	LC
83	Indian Cuckoo	<i>Cuculus micropterus</i>	<b>Cuculidae</b>	Resident and winter visitor	LC
84	Jambu Fruit Dove	<i>Ptilinopus jambu</i>	<b>Columbidae</b>	Local resident and nomadic	NT
85	Javan hawk cuckoo (Hodgson's hawk cuckoo)	<i>Cuculus fugax</i>	<b>Cuculidae</b>	local resident	LC
86	Jerdon's Baza	<i>Aviceda jerdoni</i>	<b>Accipitridae</b>	Scarce resident	LC
87	Large Green Pigeon	<i>Treron capellei</i>	<b>Columbidae</b>	Scarce resident	VU
88	Large Wood Shrike	<i>Tephrodornis gularis</i>	<b>Campephagidae</b>	Scarce resident	LC
89	Lesser Coucal	<i>Centropus bengalensis</i>	<b>Cuculidae</b>	Common resident	LC
90	Lesser Cuckooshrike	<i>Coracina fimbriata</i>	<b>Campephagidae</b>	Common resident	LC
91	Lesser Fish Eagle	<i>Ichthyophaga humilis</i>	<b>Accipitridae</b>	Scarce resident	NT
92	Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	<b>Aegithinidae</b>	Common resident	NT
93	Little Green Pigeon	<i>Treron olax</i>	<b>Columbidae</b>	Common nomadic resident	LC
94	Little Spiderhunter	<i>Arachnothera longirostra</i>	<b>Nectarinidae</b>	Common resident	LC
95	Malaysian Blue Flycatcher	<i>Cyornis turcosus</i>	<b>Muscicapidae</b>	Common resident	NT
96	Maroon Breasted Philentoma	<i>Philentoma velata</i>	<b>Muscicapidae</b>		NT
97	Maroon Woodpecker	<i>Blythipicus rubiginosus</i>	<b>Picidae</b>	Scarce resident	LC
98	Moustached Babbler	<i>Malacopteron magnirostre</i>	<b>Timaliidae</b>	Common resident	LC
99	Moustached Hawk Cuckoo	<i>Cuculus vagans</i>	<b>Cuculidae</b>	Common resident	NT
100	Olive Backed Woodpecker	<i>Dinopium rafflesii</i>	<b>Picidae</b>	Scarce resident	NT
101	Olive Winged Bulbul	<i>Pycnonotus plumosus</i>	<b>Pycnonotidae</b>	Common resident	NT
102	Orange Backed Woodpecker	<i>Reinwardtipicus validus</i>	<b>Picidae</b>	Scarce resident	LC
103	Orange Bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	<b>Dicaeidae</b>	Common resident	LC
104	Oriental Bay Owl	<i>Phodilus badius</i>	<b>Strigidae</b>	Scarce resident	LC
105	Oriental Darter	<i>Anhinga melanogaster</i>	<b>Pelicanidae</b>	local resident	NT
106	Oriental Magpie Robin	<i>Copsychus saularis</i>	<b>Turdidae</b>	Common resident	LC
107	Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	<b>Bucerotidae</b>	common resident	LC
108	Pacific Swallow	<i>Hirundo tahitica</i>	<b>Artamidae</b>	Common resident	LC
109	Pied Fantail	<i>Rhipidura javanica</i>	<b>Monarchidae</b>	local resident	LC
110	Pink Necked Green Pigeon	<i>Treron vernans</i>	<b>Columbidae</b>	Common resident	LC
111	Plain Sunbird	<i>Anthreptes simplex</i>	<b>Nectarinidae</b>	Common resident	LC
112	Plaintive Cuckoo	<i>Cacomantis merulinus</i>	<b>Cuculidae</b>	Common resident	LC
113	Puff Backed Bulbul	<i>Pycnonotus eutilotus</i>	<b>Pycnonotidae</b>	Common resident	NT

114	Purple Naped Sunbird	<i>Hypogramma hypogrammicum</i>	<b>Nectarinidae</b>	Common resident	LC
115	Raffles's Malkoha	<i>Phaenicophaeus chlorophaeus</i>	<b>Cuculidae</b>	Common resident	LC
116	Red Bearded Bee-Eater	<i>Nyctornis amictus</i>	<b>Meropidae</b>	Common resident	LC
117	Red Crowned Barbet	<i>Megalaima rafflesii</i>	<b>Ramphastidae</b>	Common resident	NT
118	Red eyed Bulbul	<i>Pycnonotus brunneus</i>	<b>Pycnonotidae</b>	Common resident	LC
119	Red Headed Tailorbird	<i>Orthotomus ruficeps</i>	<b>Sylviidae</b>	Common resident	LC
120	Red Naped Trogon	<i>Harpactes kasumba</i>	<b>Trogonidae</b>	lowland resident	NT
121	Red Throated Barbet	<i>Megalaima mystacophanos</i>	<b>Ramphastidae</b>	Common resident	NT
122	Rhinoceros Hornbill	<i>Buceros rhinoceros</i>	<b>Bucerotidae</b>	Common resident	NT
123	Rouloul (Crested partridge)	<i>Rollulus rouloul</i>	<b>Phasianidae</b>	Common resident	NT
124	Ruby Cheeked Sunbird	<i>Anthreptes singalensis</i>	<b>Nectarinidae</b>	local resident	LC
125	Rufous Crowned Babbler	<i>Malacopteron magnum</i>	<b>Timaliidae</b>	Common resident	NT
126	Rufous Piculet	<i>Sasia abnormis</i>	<b>Picidae</b>	Common resident	LC
127	Rufous Tailed Shama	<i>Trichixos pyrropygus</i>	<b>Turdidae</b>	Scare resident	NT
128	Rufous Tailed Tailorbird	<i>Orthotomus sericeus</i>	<b>Sylviidae</b>	Common resident	LC
129	Rufous Woodpecker	<i>Celeus brachyurus</i>	<b>Picidae</b>	Common resident	LC
130	Scarlet Minivet	<i>Pericrocotus flammeus</i>	<b>Campephagidae</b>	common lowland resident	LC
131	Scarlet Rumped Trogon	<i>Harpactes duvaucelii</i>	<b>Trogonidae</b>	Common resident	NT
132	Short Tailed Babbler	<i>Malacocincla malaccensis</i>	<b>Timaliidae</b>	Common resident	NT
133	Silver Rumped Spinetail	<i>Rhaphidura leucopygialis</i>	<b>Apodidae</b>	Common resident	LC
134	Slender Billed Crow	<i>Corvus enca</i>	<b>Corvidae</b>	local resident	LC
135	Sooty Capped Babbler	<i>Malacopteron affine</i>	<b>Timaliidae</b>	Common resident	NT
136	Spectacled Bulbul	<i>Pycnonotus erythrothalmos</i>	<b>Pycnonotidae</b>	Common resident	LC
137	Spectacled Spiderhunter	<i>Arachnothera flavigaster</i>	<b>Nectarinidae</b>	Scare resident	LC
138	Spotted Fantail	<i>Rhipidura perlata</i>	<b>Monarchidae</b>	local resident	LC
139	Spotted Necked Dove (Spotted dove)	<i>Streptopelia chinensis</i>	<b>Columbidae</b>	Common resident	LC
140	Square tailed drongo cuckoo (Drongo cuckoo)	<i>Surniculus lugubris</i>	<b>Cuculidae</b>	Common resident	LC
141	Stork Billed Kingfisher	<i>Pelargopsis capensis</i>	<b>Alcedinidae</b>	Common resident	LC
142	Streaked Bulbul	<i>Ixos malaccensis</i>	<b>Pycnonotidae</b>	Scare resident	NT
143	Streaky Breasted Spiderhunter	<i>Arachnothera affinis</i>	<b>Nectarinidae</b>	local resident	LC
144	Thick Billed Green Pigeon	<i>Treron curvirostra</i>	<b>Columbidae</b>	Local resident and nomadic	LC
145	Velvet Fronted	<i>Sitta frontalis</i>	<b>Pachcephalidae</b>	Common resident	LC

	Nuthatch				
146	Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	<b>Cuculidae</b>	Common resident	LC
147	Wallace's Hawk Eagle	<i>Nisaetus nanus</i>	<b>Accipitridae</b>	Scare resident	VU
148	Whiskered Treeswift	<i>Hemiprocne comate</i>	<b>Apodidae</b>	local resident	LC
149	White Bellied Woodpecker	<i>Dryocopus javensis</i>	<b>Picidae</b>	local resident	LC
150	White Breasted Waterhen	<i>Amauornis phoenicurus</i>	<b>Rallidae</b>	Common resident	LC
151	White Breasted Woodswallow	<i>Artamus leucorhynchus</i>	<b>Artamidae</b>	local resident	LC
152	White Collared Kingfisher (Collared kingfisher)	<i>Todiramphus chloris</i>	<b>Alcedinidae</b>	Common resident	LC
153	White Crowned Forktail	<i>Enicurus leschenaultia</i>	<b>Turdidae</b>	local resident	LC
154	White Crowned Hornbill	<i>Aceros comatus</i>	<b>Bucerotidae</b>	Scare resident	NT
155	White-Crowned Shama	<i>Copsychus stricklandii</i>	<b>Turdidae</b>	common endemic	unknown status
156	Wreathed Hornbill	<i>Aceros undulates</i>	<b>Bucerotidae</b>	Scare resident	LC
157	Yellow Bellied Bulbul	<i>Alophoixus phaeocephalus</i>	<b>Pycnonotidae</b>	Common resident	LC
158	Yellow Breasted Flowerpecker	<i>Prionochilus maculates</i>	<b>Dicaeidae</b>	local resident	LC
159	Yellow Eared Spiderhunter	<i>Arachnothera chrysogenys</i>	<b>Nectarinidae</b>	Scare resident	LC
160	Yellow vented Bulbul	<i>Pycnonotus goiavier</i>	<b>Pycnonotidae</b>	Common resident	LC
161	Zebra Dove	<i>Geopelia striata</i>	<b>Columbidae</b>	Common resident	LC

**Figure 9:** IUCN red list of bird's species that were found and recorded in SFM project areas Timimbang – Botitan forest reserve



**Table 11:** List of bird's species recorded within the Botitan forest reserve (class I), the bird's species were spotted and identified by Mr. Yoktan Julbit during the survey conducted in May 2014

Common Name	Scientific Name	Family	IUCN Red List
Crested Goshawk	<i>Accipiter trivirgatus</i>	Falconidae	LC
White Crowned Hornbill	<i>Aceros comatus</i>	Bucerotidae	NT
Common Sandpiper	<i>Actitis hypoleucos</i>	Scolipacidae	LC
Common Iora	<i>Aegithina tiphia</i>	Aegithinidae	LC
Green Iora	<i>Aegithina viridissima</i>	Aegithinidae	NT
Grey Cheeked Bulbul	<i>Alophoixus bres</i>	Pycnonotidae	LC
Yellow Bellied Bulbul	<i>Alophoixus phaeocephalus</i>	Pycnonotidae	LC
White Breasted Waterhen	<i>Amauornis phoenicurus</i>	Rallidae	LC
Oriental Darter	<i>Anhinga melanogaster</i>	Pelicanidae	NT
Bushy Crested Hornbill	<i>Anorrhinus galeritus</i>	Bucerotidae	LC
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	Bucerotidae	LC
Asian black hornbill	<i>Anthracoceros malayanus</i>	Bucerotidae	NT
Plain Sunbird	<i>Anthreptes simplex</i>	Nectarinidae	LC
Ruby Cheeked Sunbird	<i>Anthreptes singalensis</i>	Nectarinidae	LC
Asian glossy starling	<i>Aplonis panayensis</i>	Sturnidae	LC
House Swift	<i>Apus nipalensis</i>	Apodidae	LC
Streaky Breasted Spiderhunter	<i>Arachnothera affinis</i>	Nectarinidae	LC
Yellow Eared Spiderhunter	<i>Arachnothera chrysogenys</i>	Nectarinidae	LC
Spectacled Spiderhunter	<i>Arachnothera flavigaster</i>	Nectarinidae	LC
Little Spiderhunter	<i>Arachnothera longirostra</i>	Nectarinidae	LC
Great Argus	<i>Argusianus argus</i>	Phasianidae	NT
White Breasted Woodswallow	<i>Artamus leucorhynchus</i>	Artamidae	LC
Jerdon's Baza	<i>Aviceda jerdoni</i>	Accipitridae	LC
Maroon Woodpecker	<i>Blythipicus rubiginosus</i>	Picidae	LC
Barred eagle owl	<i>Bubo sumatranus</i>	Strigidae	LC
Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	LC
Rhinoceros Hornbill	<i>Buceros rhinoceros</i>	Bucerotidae	NT
Helmeted Hornbill	<i>Buceros vigil</i>	Bucerotidae	NT
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	Cuculidae	LC
Banded bay cuckoo	<i>Cacomantis sonneratii</i>	Cuculidae	LC
Brown barbet	<i>Calorhamphus fuliginosus</i>	Ramphastidae	LC
Rufous Woodpecker	<i>Celeus brachyurus</i>	Picidae	LC
Lesser Coucal	<i>Centropus bengalensis</i>	Cuculidae	LC
Greater Coucal	<i>Centropus sinensis</i>	Cuculidae	LC
Black backed kingfisher	<i>Ceyx erithaca</i>	Alcedinidae	LC
Emerald Dove	<i>Chalcophaps indica</i>	Columbidae	LC
Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	Aegithinidae	NT
Greater Green Leafbird	<i>Chloropsis sonnerati</i>	Aegithinidae	LC
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	Cuculidae	LC
Glossy Swiftlet	<i>Collocalia esculenta</i>	Apodidae	LC
Oriental Magpie Robin	<i>Copsychus saularis</i>	Turdidae	LC
White-Crowned Shama	<i>Copsychus stricklandii</i>	Turdidae	unknown status
Lesser Cuckooshrike	<i>Coracina fimbriata</i>	Campephagidae	LC
Slender Billed Crow	<i>Corvus enca</i>	Corvidae	LC
Dusky Broadbill	<i>Corydon sumatranus</i>	Eurylaimidae	LC
Indian Cuckoo	<i>Cuculus micropterus</i>	Cuculidae	LC

Malaysian Blue Flycatcher	<i>Cyornis turcosus</i>	<b>Muscicapidae</b>	NT
Asian palm swift	<i>Cypsiurus balasiensis</i>	<b>Apodidae</b>	LC
Orange Bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	<b>Dicaeidae</b>	LC
Bronzed drongo	<i>Dicrurus aeneus</i>	<b>Dicruridae</b>	LC
Greater Racquet Tailed Drongo	<i>Dicrurus paradiseus</i>	<b>Dicruridae</b>	LC
Olive Backed Woodpecker	<i>Dinopium rafflesii</i>	<b>Picidae</b>	NT
White Bellied Woodpecker	<i>Dryocopus javensis</i>	<b>Picidae</b>	LC
Green Imperial Pigeon	<i>Ducula aenea</i>	<b>Columbidae</b>	LC
White Crowned Forktail	<i>Enicurus leschenaulti</i>	<b>Turdidae</b>	LC
Chestnut Naped Forktail	<i>Enicurus ruficapillus</i>	<b>Turdidae</b>	NT
Black and yellow broadbill	<i>Eurylaimus ochromalus</i>	<b>Eurylaimidae</b>	NT
Zebra Dove	<i>Geopelia striata</i>	<b>Columbidae</b>	LC
Hill Myna	<i>Gracula religiosa</i>	<b>Sturnidae</b>	LC
Diard's Trogon	<i>Harpactes diardii</i>	<b>Trogonidae</b>	NT
Scarlet Rumped Trogon	<i>Harpactes duvaucelii</i>	<b>Trogonidae</b>	NT
Red Naped Trogon	<i>Harpactes kasumba</i>	<b>Trogonidae</b>	NT
Grey And Buff Woodpecker	<i>Hemicircus concretus</i>	<b>Picidae</b>	LC
Whiskered Treeswift	<i>Hemiprocne comata</i>	<b>Apodidae</b>	LC
Grey Rumped Treeswift	<i>Hemiprocne longipennis</i>	<b>Apodidae</b>	LC
Black winged flycatcher shrike	<i>Hemipus hirundinaceus</i>	<b>Campephagidae</b>	LC
Bar winged flycatcher shrike	<i>Hemipus picatus</i>	<b>Campephagidae</b>	LC
Pacific Swallow	<i>Hirundo tahitica</i>	<b>Artamidae</b>	LC
Purple Naped Sunbird	<i>Hypogramma hypogrammicum</i>	<b>Nectarinidae</b>	LC
Black naped monarch	<i>Hypothymis azurea</i>	<b>Monarchidae</b>	LC
Lesser Fish Eagle	<i>Ichthyophaga humilis</i>	<b>Accipitridae</b>	NT
Buff vented bulbul	<i>Iole olivacea</i>	<b>Pycnonotidae</b>	LC
Asian fairy bluebird	<i>Irena puella</i>	<b>Oriolidae</b>	LC
Streaked Bulbul	<i>Ixos malaccensis</i>	<b>Pycnonotidae</b>	NT
Buffy Fish Owl	<i>Ketupa ketupu</i>	<b>Strigidae</b>	LC
Chestnut Munia	<i>Lonchura atricapilla</i>	<b>Estrildidae</b>	LC
Dusky Munia	<i>Lonchura fuscans</i>	<b>Estrildidae</b>	LC
Crested Fireback	<i>Lophura ignita</i>	<b>Phasianidae</b>	NT
Blue Crowned Hanging Parrot	<i>Loriculus galgulus</i>	<b>Psittacidae</b>	LC
Bat hawk	<i>Machaeramphus alcinus</i>	<b>Accipitridae</b>	LC
Fluffy Backed Tit-Babbler	<i>Macronous ptilosus</i>	<b>Timaliidae</b>	NT
Short Tailed Babbler	<i>Malacocincla malaccensis</i>	<b>Timaliidae</b>	NT
Horsfield's Babbler	<i>Malacocincla sepiaria</i>	<b>Timaliidae</b>	LC
Sooty Capped Babbler	<i>Malacopteron affine</i>	<b>Timaliidae</b>	NT
Moustached Babbler	<i>Malacopteron magnirostre</i>	<b>Timaliidae</b>	LC
Rufous Crowned Babbler	<i>Malacopteron magnum</i>	<b>Timaliidae</b>	NT
Blue Eared Barbet	<i>Megalaima australis</i>	<b>Ramphastidae</b>	LC
Gold-Whiskered Barbet	<i>Megalaima chrysopogon</i>	<b>Ramphastidae</b>	LC
Red Throated Barbet	<i>Megalaima mystacophanos</i>	<b>Ramphastidae</b>	NT
Red Crowned Barbet	<i>Megalaima rafflesii</i>	<b>Ramphastidae</b>	NT
Blue Throated Bee-Eater	<i>Merops viridis</i>	<b>Meropidae</b>	LC
Changeable hawk eagle	<i>Nisaetus cirrhatus</i>	<b>Accipitridae</b>	LC
Wallace's Hawk Eagle	<i>Nisaetus nanus</i>	<b>Accipitridae</b>	VU
Red Bearded Bee-Eater	<i>Nyctyornis amictus</i>	<b>Meropidae</b>	LC
Dark Throated Oriole	<i>Oriolus xanthonotus</i>	<b>Oriolidae</b>	NT
Red Headed Tailorbird	<i>Orthotomus ruficeps</i>	<b>Sylviidae</b>	LC
Rufous Tailed Tailorbird	<i>Orthotomus sericeus</i>	<b>Sylviidae</b>	LC
Eurasian Tree Sparrow	<i>Passer montanus</i>	<b>Passeridae</b>	LC
Stork Billed Kingfisher	<i>Pelargopsis capensis</i>	<b>Alcedinidae</b>	LC

Black capped babbler	<i>Pellorneum capistratum</i>	<b>Timaliidae</b>	LC
Scarlet Minivet	<i>Pericrocotus flammeus</i>	<b>Campephagidae</b>	LC
Fiery Minivet	<i>Pericrocotus igneus</i>	<b>Campephagidae</b>	NT
Raffles's Malkoha	<i>Phaenicophaeus chlorophaeus</i>	<b>Cuculidae</b>	LC
Chestnut Breasted Malkoha	<i>Phaenicophaeus curvirostris</i>	<b>Cuculidae</b>	LC
Black bellied malkoha	<i>Phaenicophaeus diardi</i>	<b>Cuculidae</b>	NT
Chestnut Bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	<b>Cuculidae</b>	NT
Maroon Breasted Philentoma	<i>Philentoma velata</i>	<b>Muscicapidae</b>	NT
Oriental Bay Owl	<i>Phodilus badius</i>	<b>Strigidae</b>	LC
Crimson Winged Woodpecker	<i>picus puniceus</i>	<b>Picidae</b>	LC
Blue Headed Pitta	<i>Pitta baidii</i>	<b>Pittidae</b>	VU
Black headed pitta	<i>Pitta ussherri</i>	<b>Pittidae</b>	NT
Crested jay	<i>Platylophus galericulatus</i>	<b>Corvidae</b>	NT
Black magpie	<i>Platysmurus leucopterus</i>	<b>Corvidae</b>	NT
Yellow Breasted Flowerpecker	<i>Prionochilus maculatus</i>	<b>Dicaeidae</b>	LC
Blue Rumped Parrot	<i>Psittinus cyanurus</i>	<b>Psittacidae</b>	NT
Black headed bulbul	<i>Pycnonotus atriceps</i>	<b>Pycnonotidae</b>	LC
Red eyed Bulbul	<i>Pycnonotus brunneus</i>	<b>Pycnonotidae</b>	LC
Spectacled Bulbul	<i>Pycnonotus erythrophthalmos</i>	<b>Pycnonotidae</b>	LC
Puff Backed Bulbul	<i>Pycnonotus eutilotus</i>	<b>Pycnonotidae</b>	NT
Yellow vented Bulbul	<i>Pycnonotus goiavier</i>	<b>Pycnonotidae</b>	LC
Olive Winged Bulbul	<i>Pycnonotus plumosus</i>	<b>Pycnonotidae</b>	NT
Cream Vented Bulbul	<i>Pycnonotus simplex</i>	<b>Pycnonotidae</b>	LC
Orange Backed Woodpecker	<i>Reinwardtipicus validus</i>	<b>Picidae</b>	LC
Silver Rumped Spinetail	<i>Rhaphidura leucopygialis</i>	<b>Apodidae</b>	LC
Grey Chested Jungle Flycatcher	<i>Rhinomyias umbratilis</i>	<b>Muscicapidae</b>	NT
Pied Fantail	<i>Rhipidura javanica</i>	<b>Monarchidae</b>	LC
Spotted Fantail	<i>Rhipidura perlata</i>	<b>Monarchidae</b>	LC
Roulroul (Crested partridge)	<i>Rollulus rouloul</i>	<b>Phasianidae</b>	NT
Rufous Piculet	<i>Sasia abnormis</i>	<b>Picidae</b>	LC
Crested Serpent Eagle	<i>Spilornis cheela</i>	<b>Accipitridae</b>	LC
Chestnut Rumped Babbler	<i>Stachyris maculata</i>	<b>Timaliidae</b>	NT
Grey Headed Babbler	<i>Stachyris poliocephala</i>	<b>Timaliidae</b>	LC
Spotted Necked Dove (Spotted dove)	<i>Streptopelia chinensis</i>	<b>Columbidae</b>	LC
Brown wood owl	<i>Strix leptogrammica</i>	<b>Strigidae</b>	LC
Square tailed drongo cuckoo (Drongo cuckoo)	<i>Surniculus lugubris</i>	<b>Cuculidae</b>	LC
Asian paradise lycatcher	<i>Terpsiphone paradisi</i>	<b>Monarchidae</b>	LC
White Collared Kingfisher (Collared kingfisher)	<i>Todiramphus chloris</i>	<b>Alcedinidae</b>	LC
Large Green Pigeon	<i>Treron capellei</i>	<b>Columbidae</b>	VU
Thick Billed Green Pigeon	<i>Treron curvirostra</i>	<b>Columbidae</b>	LC
Little Green Pigeon	<i>Treron olax</i>	<b>Columbidae</b>	LC
Pink Necked Green Pigeon	<i>Treron vernans</i>	<b>Columbidae</b>	LC
Ferruginous Babbler	<i>Trichastoma bicolor</i>	<b>Timaliidae</b>	LC
Hairy Backed Bulbul	<i>Tricholestes criniger</i>	<b>Pycnonotidae</b>	LC
Barn owl	<i>Tyto alba</i>	<b>Strigidae</b>	LC

**Table 12:** A list of birds' species detected and recorded in Timimbang forest reserve part A (class II), the bird's species were spotted and identified by Mr. Yoktan Julbit during the survey conducted in May 2014

Common Name	Scientific Name	Family	IUCN Red List
Asian black hornbill	<i>Anthracoceros malayanus</i>	Bucerotidae	NT
Asian fairy bluebird	<i>Irena puella</i>	Oriolidae	LC
Asian glossy starling	<i>Aplonis panayensis</i>	Sturnidae	LC
Asian paradise flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	LC
Banded bay cuckoo	<i>Cacomantis sonneratii</i>	Cuculidae	LC
Banded broadbill	<i>Eurylaimus javanicus</i>	Eurylaimidae	LC
Banded woodpecker	<i>Picus mineaceus</i>	Picidae	LC
Bar winged flycatcher shrike	<i>Hemipus picatus</i>	Campephagidae	LC
Barn owl	<i>Tyto alba</i>	Strigidae	LC
Barred eagle owl	<i>Bubo sumatranus</i>	Strigidae	LC
Bat hawk	<i>Machaeramphus alcinus</i>	Accipitridae	LC
Black and yellow broadbill	<i>Eurylaimus ochromalus</i>	Eurylaimidae	NT
Black backed kingfisher	<i>Ceyx erithaca</i>	Alcedinidae	LC
Black bellied malkoha	<i>Phaenicophaeus diardi</i>	Cuculidae	NT
Black capped babbler	<i>Pellorneum capistratum</i>	Timaliidae	LC
Black headed bulbul	<i>Pycnonotus atriceps</i>	Pycnonotidae	LC
Black headed pitta	<i>Pitta ussheri</i>	Pittidae	NT
Black magpie	<i>Platysmurus leucopterus</i>	Corvidae	NT
Black naped monarch	<i>Hypothymis azurea</i>	Monarchidae	LC
Black throated babbler	<i>Stachyris nigricollis</i>	Timaliidae	NT
Black winged flycatcher shrike	<i>Hemipus hirundinaceus</i>	Campephagidae	LC
Blue Crowned Hanging Parrot	<i>Loriculus galgulus</i>	Psittacidae	LC
Blue Eared Barbet	<i>Megalaima australis</i>	Ramphastidae	LC
Blue Headed Pitta	<i>Pitta baudii</i>	Pittidae	VU
Blue Rumped Parrot	<i>Psittinus cyanurus</i>	Psittacidae	NT
Blue Throated Bee-Eater	<i>Merops viridis</i>	Meropidae	LC
Blyth's hawk eagle	<i>Nisaetus alboniger</i>	Accipitridae	LC
Bronzed drongo	<i>Dicrurus aeneus</i>	Dicruridae	LC
Brown barbet	<i>Calorhamphus fuliginosus</i>	Ramphastidae	LC
Brown fulvetta	<i>Alcippe brunneicauda</i>	Timaliidae	NT
Brown wood owl	<i>Strix leptogrammica</i>	Strigidae	LC
Buff vented bulbul	<i>Iole olivacea</i>	Pycnonotidae	LC
Buffy Fish Owl	<i>Ketupa ketupu</i>	Strigidae	LC
Bushy Crested Hornbill	<i>Anorrhinus galeritus</i>	Bucerotidae	LC
Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	LC
Changeable hawk eagle	<i>Nisaetus cirrhatus</i>	Accipitridae	LC
Chestnut Backed Scimitar Babbler	<i>Pomatorhinus montanus</i>	Timaliidae	LC
Chestnut Bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	Cuculidae	NT
Chestnut Breasted Malkoha	<i>Phaenicophaeus curvirostris</i>	Cuculidae	LC
Chestnut Munia	<i>Lonchura atricapilla</i>	Estrildidae	LC
Chestnut Naped Forktail	<i>Enicurus ruficapillus</i>	Turdidae	NT
Chestnut necklaced hill partridge (Scaly breasted partridge)	<i>Arborophila chloropus</i>	Phasianidae	LC
Chestnut Rumped Babbler	<i>Stachyris maculata</i>	Timaliidae	NT
Chestnut Winged Babbler	<i>Stachyris erythroptera</i>	Timaliidae	LC
White Collared Kingfisher (Collared kingfisher)	<i>Todiramphus chloris</i>	Alcedinidae	LC

Common Iora	<i>Aegithina tiphia</i>	<b>Aegithinidae</b>	LC
Common Sandpiper	<i>Actitis hypoleucos</i>	<b>Scolopacidae</b>	LC
Cream Vented Bulbul	<i>Pycnonotus simplex</i>	<b>Pycnonotidae</b>	LC
Crested Fireback	<i>Lophura ignita</i>	<b>Phasianidae</b>	NT
Crested Goshawk	<i>Accipiter trivirgatus</i>	<b>Falconidae</b>	LC
Crested Jay	<i>Platylophus galericulatus</i>	<b>Corvidae</b>	NT
Crested Serpent Eagle	<i>Spilornis cheela</i>	<b>Accipitridae</b>	LC
Crimson Winged Woodpecker	<i>Picus puniceus</i>	<b>Picidae</b>	LC
Dark Throated Oriole	<i>Oriolus xanthonotus</i>	<b>Oriolidae</b>	NT
Diard's Trogon	<i>Harpactes diardii</i>	<b>Trogonidae</b>	NT
Dusky Broadbill	<i>Corydon sumatranus</i>	<b>Eurylaimidae</b>	LC
Dusky Munia	<i>Lonchura fuscans</i>	<b>Estrildidae</b>	LC
Emerald Dove	<i>Chalcophaps indica</i>	<b>Columbidae</b>	LC
Eurasian Tree Sparrow	<i>Passer montanus</i>	<b>Passeridae</b>	LC
Ferruginous Babbler	<i>Trichastoma bicolor</i>	<b>Timaliidae</b>	LC
Fiery Minivet	<i>Pericrocotus igneus</i>	<b>Campephagidae</b>	NT
Finsch's bulbul	<i>Alophoixus finschii</i>	<b>Pycnonotidae</b>	NT
Fluffy Backed Tit-Babbler	<i>Macronous ptilosus</i>	<b>Timaliidae</b>	NT
Glossy Swiftlet	<i>Collocalia esculenta</i>	<b>Apodidae</b>	LC
Gold-Whiskered Barbet	<i>Megalaima chrysopogon</i>	<b>Ramphastidae</b>	LC
Great Argus	<i>Argusianus argus</i>	<b>Phasianidae</b>	NT
Greater Coucal	<i>Centropus sinensis</i>	<b>Cuculidae</b>	LC
Greater Green Leafbird	<i>Chloropsis sonnerati</i>	<b>Aegithinidae</b>	LC
Greater Racquet Tailed Drongo	<i>Dicrurus paradiseus</i>	<b>Dicruridae</b>	LC
Green Imperial Pigeon	<i>Ducula aenea</i>	<b>Columbidae</b>	LC
Green Iora	<i>Aegithina viridissima</i>	<b>Aegithinidae</b>	NT
Grey And Buff Woodpecker	<i>Hemicircus concretus</i>	<b>Picidae</b>	LC
Grey Cheeked Bulbul	<i>Alophoixus bres</i>	<b>Pycnonotidae</b>	LC
Grey Chested Jungle Flycatcher	<i>Rhinomyias umbratilis</i>	<b>Muscicapidae</b>	NT
Grey Headed Babbler	<i>Stachyris poliocephala</i>	<b>Timaliidae</b>	LC
Grey Rumped Treeswift	<i>Hemiprocne longipennis</i>	<b>Apodidae</b>	LC
Hairy Backed Bulbul	<i>Tricholestes criniger</i>	<b>Pycnonotidae</b>	LC
Helmeted Hornbill	<i>Buceros vigil</i>	<b>Bucerotidae</b>	NT
Hill Myna	<i>Gracula religiosa</i>	<b>Sturnidae</b>	LC
Horsfield's Babbler	<i>Malacocincla sepiaria</i>	<b>Timaliidae</b>	LC
House Swift	<i>Apus nipalensis</i>	<b>Apodidae</b>	LC
Indian Cuckoo	<i>Cuculus micropterus</i>	<b>Cuculidae</b>	LC
Jambu Fruit Dove	<i>Ptilinopus jambu</i>	<b>Columbidae</b>	NT
Javan hawk cuckoo (Hodgson's hawk cuckoo)	<i>Cuculus fugax</i>	<b>Cuculidae</b>	LC
Jerdon's Baza	<i>Aviceda jerdoni</i>	<b>Accipitridae</b>	LC
Large Green Pigeon	<i>Treron capellei</i>	<b>Columbidae</b>	VU
Large Wood Shrike	<i>Tephrodornis gularis</i>	<b>Campephagidae</b>	LC
Lesser Coucal	<i>Centropus bengalensis</i>	<b>Cuculidae</b>	LC
Lesser Cuckooshrike	<i>Coracina fimbriata</i>	<b>Campephagidae</b>	LC
Lesser Fish Eagle	<i>Ichthyophaga humilis</i>	<b>Accipitridae</b>	NT
Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	<b>Aegithinidae</b>	NT
Little Green Pigeon	<i>Treron olax</i>	<b>Columbidae</b>	LC
Little Spiderhunter	<i>Arachnothera longirostra</i>	<b>Nectarinidae</b>	LC
Malaysian Blue Flycatcher	<i>Cyornis turcosus</i>	<b>Muscicapidae</b>	NT
Maroon Breasted Philentoma	<i>Philentoma velata</i>	<b>Muscicapidae</b>	NT
Maroon Woodpecker	<i>Blythipicus rubiginosus</i>	<b>Picidae</b>	LC
Moustached Babbler	<i>Malacopteron magnirostre</i>	<b>Timaliidae</b>	LC
Moustached Hawk Cuckoo	<i>Cuculus vagans</i>	<b>Cuculidae</b>	NT



Olive Backed Woodpecker	<i>Dinopium rafflesii</i>	Picidae	NT
Olive Winged Bulbul	<i>Pycnonotus plumosus</i>	Pycnonotidae	NT
Orange Backed Woodpecker	<i>Reinwardtipicus validus</i>	Picidae	LC
Orange Bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	Dicaeidae	LC
Oriental Bay Owl	<i>Phodilus badius</i>	Strigidae	LC
Oriental Darter	<i>Anhinga melanogaster</i>	Pelicanidae	NT
Oriental Magpie Robin	<i>Copsychus saularis</i>	Turdidae	LC
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	Bucerotidae	LC
Pacific Swallow	<i>Hirundo tahitica</i>	Artamidae	LC
Pied Fantail	<i>Rhipidura javanica</i>	Monarchidae	LC
Pink Necked Green Pigeon	<i>Treron vernans</i>	Columbidae	LC
Plain Sunbird	<i>Anthreptes simplex</i>	Nectarinidae	LC
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	Cuculidae	LC
Puff Backed Bulbul	<i>Pycnonotus eutilotus</i>	Pycnonotidae	NT
Purple Naped Sunbird	<i>Hypogramma hypogrammicum</i>	Nectarinidae	LC
Raffles's Malkoha	<i>Phaenicophaeus chlorophaeus</i>	Cuculidae	LC
Red Crowned Barbet	<i>Megalaima rafflesii</i>	Ramphastidae	NT
Red eyed Bulbul	<i>Pycnonotus brunneus</i>	Pycnonotidae	LC
Red Headed Tailorbird	<i>Orthotomus ruficeps</i>	Sylviidae	LC
Red Naped Trogon	<i>Harpactes kasumba</i>	Trogonidae	NT
Red Throated Barbet	<i>Megalaima mystacophanos</i>	Ramphastidae	NT
Rhinoceros Hornbill	<i>Buceros rhinoceros</i>	Bucerotidae	NT
Rouloul (Crested partridge)	<i>Rollulus rouloul</i>	Phasianidae	NT
Ruby Cheeked Sunbird	<i>Anthreptes singalensis</i>	Nectarinidae	LC
Rufous Crowned Babbler	<i>Malacopteron magnum</i>	Timaliidae	NT
Rufous Piculet	<i>Sasia abnormis</i>	Picidae	LC
Rufous Tailed Shama	<i>Trichixos pyrropygus</i>	Turdidae	NT
Rufous Tailed Tailorbird	<i>Orthotomus sericeus</i>	Sylviidae	LC
Rufous Woodpecker	<i>Celeus brachyurus</i>	Picidae	LC
Scarlet Minivet	<i>Pericrocotus flammeus</i>	Campephagidae	LC
Scarlet Rumped Trogon	<i>Harpactes duvaucelii</i>	Trogonidae	NT
Short Tailed Babbler	<i>Malacocincla malaccensis</i>	Timaliidae	NT
Silver Rumped Spinetail	<i>Rhaphidura leucopygialis</i>	Apodidae	LC
Slender Billed Crow	<i>Corvus enca</i>	Corvidae	LC
Sooty Capped Babbler	<i>Malacopteron affine</i>	Timaliidae	NT
Spectacled Bulbul	<i>Pycnonotus erythrophthalmos</i>	Pycnonotidae	LC
Spectacled Spiderhunter	<i>Arachnothera flavigaster</i>	Nectarinidae	LC
Spotted Fantail	<i>Rhipidura perlata</i>	Monarchidae	LC
Spotted Necked Dove (Spotted dove)	<i>Streptopelia chinensis</i>	Columbidae	LC
Square tailed drongo cuckoo (Drongo cuckoo)	<i>Surniculus lugubris</i>	Cuculidae	LC
Stork Billed Kingfisher	<i>Pelargopsis capensis</i>	Alcedinidae	LC
Streaked Bulbul	<i>Ixos malaccensis</i>	Pycnonotidae	NT
Streaky Breasted Spiderhunter	<i>Arachnothera affinis</i>	Nectarinidae	LC
Thick Billed Green Pigeon	<i>Treron curvirostra</i>	Columbidae	LC
Velvet Fronted Nuthatch	<i>Sitta frontalis</i>	Pachcephalidae	LC
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	Cuculidae	LC
Wallace's Hawk Eagle	<i>Nisaetus nanus</i>	Accipitridae	VU
Whiskered Treeswift	<i>Hemiprocnis comata</i>	Apodidae	LC
White Breasted Waterhen	<i>Amauornis phoenicurus</i>	Rallidae	LC
White Breasted Woodswallow	<i>Artamus leucorhynchus</i>	Artamidae	LC
White Crowned Forktail	<i>Enicurus leschenaulti</i>	Turdidae	LC
White Crowned Hornbill	<i>Aceros comatus</i>	Bucerotidae	NT
White-Crowned Shama	<i>Copsychus stricklandii</i>	Turdidae	unknown

			status
White Bellied Woodpecker	<i>Dryocopus javensis</i>	Picidae	LC
Wreathed Hornbill	<i>Aceros undulatus</i>	Bucerotidae	LC
Yellow Bellied Bulbul	<i>Alophoixus phaeocephalus</i>	Pycnonotidae	LC
Yellow Breasted Flowerpecker	<i>Prionochilus maculatus</i>	Dicaeidae	LC
Yellow Eared Spiderhunter	<i>Arachnothera chrysogenys</i>	Nectarinidae	LC
Yellow vented Bulbul	<i>Pycnonotus goiavier</i>	Pycnonotidae	LC
Zebra Dove	<i>Geopelia striata</i>	Columbidae	LC

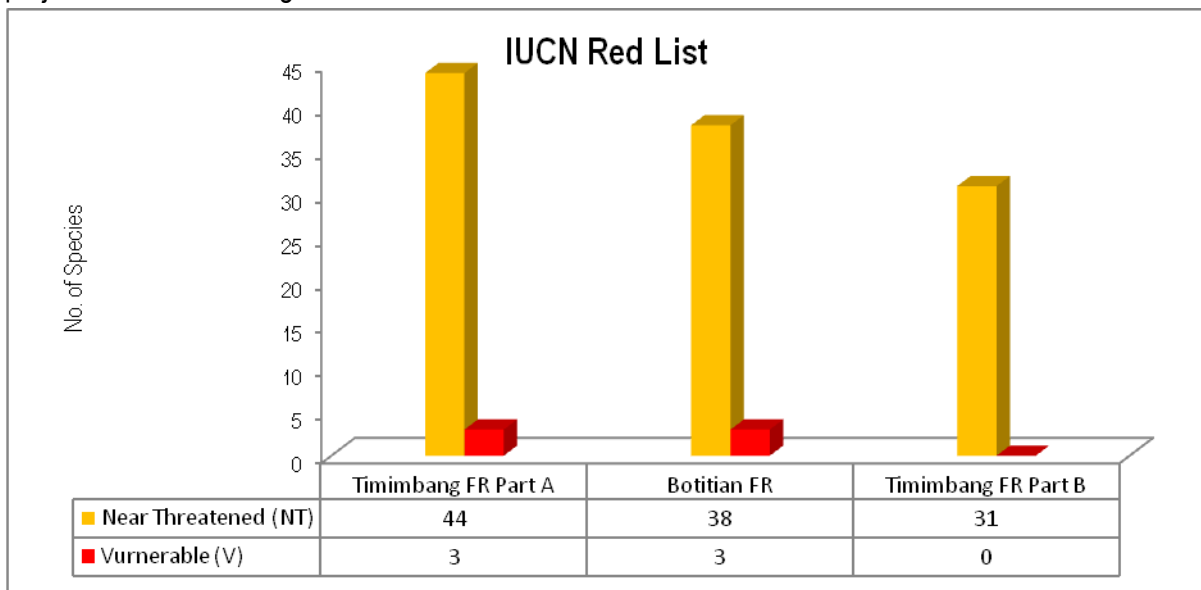
**Table 13:** A list of birds' species detected and recorded in Timimbang forest reserve part B (class II), all the bird's species were spotted and identified by Mr. Yoktan Julbit during the survey conducted in May 2014

Common Name	Scientific Name	Family	IUCN Red List
Asian black hornbill	<i>Anthracoceros malayanus</i>	Bucerotidae	NT
Asian fairy bluebird	<i>Irena puella</i>	Oriolidae	LC
Asian glossy starling	<i>Aplonis panayensis</i>	Sturnidae	LC
Asian paradise flycatcher	<i>Terpsiphone paradisi</i>	Monarchidae	LC
Banded bay cuckoo	<i>Cacomantis sonneratii</i>	Cuculidae	LC
Banded woodpecker	<i>Picus mineaceus</i>	Picidae	LC
Barn owl	<i>Tyto alba</i>	Strigidae	LC
Black and yellow broadbill	<i>Eurylaimus ochromalus</i>	Eurylaimidae	NT
Black backed kingfisher	<i>Ceyx erithaca</i>	Alcedinidae	LC
Black capped babbler	<i>Pellorneum capistratum</i>	Timaliidae	LC
Black headed bulbul	<i>Pycnonotus atriceps</i>	Pycnonotidae	LC
Black headed pitta	<i>Pitta ussheri</i>	Pittidae	NT
Black magpie	<i>Platysmurus leucopterus</i>	Corvidae	NT
Black naped monarch	<i>Hypothymis azurea</i>	Monarchidae	LC
Black throated babbler	<i>Stachyris nigricollis</i>	Timaliidae	NT
Black winged flycatcher shrike	<i>Hemipus hirundinaceus</i>	Campephagidae	LC
Blue Crowned Hanging Parrot	<i>Loriculus galgulus</i>	Psittacidae	LC
Blue Eared Barbet	<i>Megalaima australis</i>	Ramphastidae	LC
Blue Rumped Parrot	<i>Psittinus cyanurus</i>	Psittacidae	NT
Blue Throated Bee-Eater	<i>Merops viridis</i>	Meropidae	LC
Bronzed drongo	<i>Dicrurus aeneus</i>	Dicruridae	LC
Brown barbet	<i>Calorhamphus fuliginosus</i>	Ramphastidae	LC
Brown fulvetta	<i>Alcippe brunneicauda</i>	Timaliidae	NT
Brown wood owl	<i>Strix leptogrammica</i>	Strigidae	LC
Buff vented bulbul	<i>Iole olivacea</i>	Pycnonotidae	LC
Buffy Fish Owl	<i>Ketupa ketupu</i>	Strigidae	LC
Bushy Crested Hornbill	<i>Anorrhinus galeritus</i>	Bucerotidae	LC
Cattle Egret	<i>Bubulcus ibis</i>	Ardeidae	LC
Changeable hawk eagle	<i>Nisaetus cirrhatus</i>	Accipitridae	LC
Chestnut Bellied Malkoha	<i>Phaenicophaeus sumatranus</i>	Cuculidae	NT
Chestnut Breasted Malkoha	<i>Phaenicophaeus curvirostris</i>	Cuculidae	LC
Chestnut Munia	<i>Lonchura atricapilla</i>	Estrildidae	LC
Chestnut necklaced hill partridge (Scaly breasted partridge)	<i>Arborophila chloropus</i>	Phasianidae	LC
Chestnut Rumped Babbler	<i>Stachyris maculata</i>	Timaliidae	NT
Common Sandpiper	<i>Actitis hypoleucos</i>	Scolipacidae	LC
Cream Vented Bulbul	<i>Pycnonotus simplex</i>	Pycnonotidae	LC
Crested Fireback	<i>Lophura ignita</i>	Phasianidae	NT

Crested Goshawk	<i>Accipiter trivirgatus</i>	Falconidae	LC
Crested Serpent Eagle	<i>Spilornis cheela</i>	Accipitridae	LC
Diard's Trogon	<i>Harpactes diardii</i>	Trogonidae	NT
Dusky Munia	<i>Lonchura fuscans</i>	Estrildidae	LC
Emerald Dove	<i>Chalcophaps indica</i>	Columbidae	LC
Eurasian Tree Sparrow	<i>Passer montanus</i>	Passeridae	LC
Ferruginous Babbler	<i>Trichastoma bicolor</i>	Timaliidae	LC
Fluffy Backed Tit-Babbler	<i>Macronous ptilosus</i>	Timaliidae	NT
Glossy Swiftlet	<i>Collocalia esculenta</i>	Apodidae	LC
Gold-Whiskered Barbet	<i>Megalaima chrysopogon</i>	Ramphastidae	LC
Great Argus	<i>Argusianus argus</i>	Phasianidae	NT
Greater Coucal	<i>Centropus sinensis</i>	Cuculidae	LC
Greater Green Leafbird	<i>Chloropsis sonnerati</i>	Aegithinidae	LC
Green Imperial Pigeon	<i>Ducula aenea</i>	Columbidae	LC
Green Iora	<i>Aegithina viridissima</i>	Aegithinidae	NT
Grey And Buff Woodpecker	<i>Hemicircus concretus</i>	Picidae	LC
Grey Capped Woodpecker	<i>Dendrocopos canicapillus</i>	Picidae	LC
Grey Cheeked Bulbul	<i>Alophoixus bres</i>	Pycnonotidae	LC
Grey Rumped Treeswift	<i>Hemiprocne longipennis</i>	Apodidae	LC
Hairy Backed Bulbul	<i>Tricholestes criniger</i>	Pycnonotidae	LC
Hill Myna	<i>Gracula religiosa</i>	Sturnidae	LC
Horsfield's Babbler	<i>Malacocincla sepiaria</i>	Timaliidae	LC
House Swift	<i>Apus nipalensis</i>	Apodidae	LC
Indian Cuckoo	<i>Cuculus micropterus</i>	Cuculidae	LC
Jerdon's Baza	<i>Aviceda jerdoni</i>	Accipitridae	LC
Large Wood Shrike	<i>Tephrodornis gularis</i>	Campephagidae	LC
Lesser Coucal	<i>Centropus bengalensis</i>	Cuculidae	LC
Lesser Fish Eagle	<i>Ichthyophaga humilis</i>	Accipitridae	NT
Lesser Green Leafbird	<i>Chloropsis cyanopogon</i>	Aegithinidae	NT
Little Green Pigeon	<i>Treron olax</i>	Columbidae	LC
Little Spiderhunter	<i>Arachnothera longirostra</i>	Nectarinidae	LC
Malaysian Blue Flycatcher	<i>Cyornis turcosus</i>	Muscicapidae	NT
Maroon Breasted Philentoma	<i>Philentoma velata</i>	Muscicapidae	NT
Maroon Woodpecker	<i>Blythipicus rubiginosus</i>	Picidae	LC
Moustached Babbler	<i>Malacopteron magnirostre</i>	Timaliidae	LC
Moustached Hawk Cuckoo	<i>Cuculus vagans</i>	Cuculidae	NT
Olive Winged Bulbul	<i>Pycnonotus plumosus</i>	Pycnonotidae	NT
Orange Backed Woodpecker	<i>Reinwardtipicus validus</i>	Picidae	LC
Orange Bellied Flowerpecker	<i>Dicaeum trigonostigma</i>	Dicaeidae	LC
Oriental Bay Owl	<i>Phodilus badius</i>	Strigidae	LC
Oriental Darter	<i>Anhinga melanogaster</i>	Pelicanidae	NT
Oriental Magpie Robin	<i>Copsychus saularis</i>	Turdidae	LC
Oriental Pied Hornbill	<i>Anthracoceros albirostris</i>	Bucerotidae	LC
Pacific Swallow	<i>Hirundo tahitica</i>	Artamidae	LC
Pied Fantail	<i>Rhipidura javanica</i>	Monarchidae	LC
Pink Necked Green Pigeon	<i>Treron vernans</i>	Columbidae	LC
Plain Sunbird	<i>Anthreptes simplex</i>	Nectarinidae	LC
Plaintive Cuckoo	<i>Cacomantis merulinus</i>	Cuculidae	LC
Puff Backed Bulbul	<i>Pycnonotus eutilotus</i>	Pycnonotidae	NT
Purple Naped Sunbird	<i>Hypogramma hypogrammicum</i>	Nectarinidae	LC
Raffles's Malkoha	<i>Phaenicophaeus chlorophaeus</i>	Cuculidae	LC
Red Bearded Bee-Eater	<i>Nyctornis amictus</i>	Meropidae	LC
Red eyed Bulbul	<i>Pycnonotus brunneus</i>	Pycnonotidae	LC

Red Headed Tailorbird	<i>Orthotomus ruficeps</i>	<b>Sylviidae</b>	LC
Red Naped Trogon	<i>Harpactes kasumba</i>	<b>Trogonidae</b>	NT
Red Throated Barbet	<i>Megalaima mystacophanos</i>	<b>Ramphastidae</b>	NT
Rhinoceros Hornbill	<i>Buceros rhinoceros</i>	<b>Bucerotidae</b>	NT
Roulroul (Crested partridge)	<i>Rollulus rouloul</i>	<b>Phasianidae</b>	NT
Ruby Cheeked Sunbird	<i>Anthreptes singalensis</i>	<b>Nectarinidae</b>	LC
Rufous Crowned Babbler	<i>Malacopteron magnum</i>	<b>Timaliidae</b>	NT
Rufous Piculet	<i>Sasia abnormis</i>	<b>Picidae</b>	LC
Rufous Tailed Shama	<i>Trichixos pyrropygus</i>	<b>Turdidae</b>	NT
Rufous Woodpecker	<i>Celeus brachyurus</i>	<b>Picidae</b>	LC
Scarlet Rumped Trogon	<i>Harpactes duvaucelii</i>	<b>Trogonidae</b>	NT
Short Tailed Babbler	<i>Malacocincla malaccensis</i>	<b>Timaliidae</b>	NT
Silver Rumped Spinetail	<i>Rhaphidura leucopygialis</i>	<b>Apodidae</b>	LC
Slender Billed Crow	<i>Corvus enca</i>	<b>Corvidae</b>	LC
Sooty Capped Babbler	<i>Malacopteron affine</i>	<b>Timaliidae</b>	NT
Spectacled Bulbul	<i>Pycnonotus erythrophthalmos</i>	<b>Pycnonotidae</b>	LC
Spectacled Spiderhunter	<i>Arachnothera flavigaster</i>	<b>Nectarinidae</b>	LC
Spotted Fantail	<i>Rhipidura perlata</i>	<b>Monarchidae</b>	LC
Spotted Necked Dove (Spotted dove)	<i>Streptopelia chinensis</i>	<b>Columbidae</b>	LC
Square tailed drongo cuckoo (Drongo cuckoo)	<i>Surniculus lugubris</i>	<b>Cuculidae</b>	LC
Stork Billed Kingfisher	<i>Pelargopsis capensis</i>	<b>Alcedinidae</b>	LC
Violet Cuckoo	<i>Chrysococcyx xanthorhynchus</i>	<b>Cuculidae</b>	LC
Whiskered Treeswift	<i>Hemiprocne comata</i>	<b>Apodidae</b>	LC
White Bellied Woodpecker	<i>Dryocopus javensis</i>	<b>Picidae</b>	LC
White Breasted Waterhen	<i>Amaurornis phoenicurus</i>	<b>Rallidae</b>	LC
White Breasted Woodswallow	<i>Artamus leucorhynchus</i>	<b>Artamidae</b>	LC
White Collared Kingfisher (Collared kingfisher)	<i>Todiramphus chloris</i>	<b>Alcedinidae</b>	LC
White Crowned Forktail	<i>Enicurus leschenaulti</i>	<b>Turdidae</b>	LC
White-Crowned Shama	<i>Copsychus stricklandii</i>	<b>Turdidae</b>	unknown status
Yellow Bellied Bulbul	<i>Alophoixus phaeocephalus</i>	<b>Pycnonotidae</b>	LC
Yellow Breasted Flowerpecker	<i>Prionochilus maculatus</i>	<b>Dicaeidae</b>	LC
Yellow vented Bulbul	<i>Pycnonotus goiavier</i>	<b>Pycnonotidae</b>	LC
Zebra Dove	<i>Geopelia striata</i>	<b>Columbidae</b>	LC

**Figure 10:** IUCN red list of birds species found between three (3) different study sites within SFM project areas Timimbang-Botitian forest reserve



## DISCUSSION

- ❑ There are only 18 species of large terrestrial mammals detected throughout the rapid assessment between three different study sites in SFM project area Timimbang – Botitian forest reserve. The results no indicate that there were only eighteen (18) species of large mammals in these areas. Inadequate survey time, rugged topography, thick undergrowth of shrub in some part of the forest and human activities surrounded as well as within the forest reserve making limited visibility, and the cryptic behavior of some species lead the numbers of big mammals have not been encountered. The nocturnal behavior of some species also contributed to the non-sighting, Sambar deer (*Cervus unicolor*) and Bearded pig (*Sus barbatus*) for instance, despite the fact that there were heavy sign in all the three study sites but it was difficult to spot them during the night time.
- ❑ During the survey, we have found and records the elephant prints and dung within the Timimbang forest reserve part B, and based on the signs detected we recognized that it was only one individual (could be separated from the other group). There is no sign of elephant found in Timimbang FR part A and Botitian FR. As highlighted by Ancrenaz (2008), the largest terrestrial mammals such Elephants are completely absent from the Botitian forest reserve. Also, some large terrestrial mammals species such clouded leopard and Sun bear have not been recorded in Botitian forest reserve during our surveys. The absence of sign's doesn't necessarily mean a complete absence of these species into Botitian FR, but show that occur at a very low abundance if present (Ancrenaz, 2008).
- ❑ Hunting activities may also have made the wildlife species too wary of human presence, thus very few wildlife (large terrestrial mammals) were detected during the survey period. In fact, some platforms and old cutting sign's were found during our surveys in Timimbang forest reserve. Previous studies made by HUTAN also highlighted in relation to the hunting pressure in Botitian FR. According to Ancrenaz (2008), hunting pressure is extremely high and non-specific since a lot of spring snare and traps were found. The highway linking Sapi Nangoh to Pitias is easy access and might extensively used at night to search wild boar and other game species. Based on the historical and current situation, poaching pressure might responsible for the low wildlife abundance and

diversity encountered into the Botitian FR. Another issue concerned is, the Botitian forest reserve are completely isolated from others forest and surrounded by human activities (settlement and plantations). Fragmentation is a major threat to all wildlife populations, since isolated populations are more sensitive to catastrophes (fires, poaching and diseases) and to genetic drift and inbreeding (Ancrenaz, 2008).

- ❑ During the wildlife inventories and assessment made in SFM project areas Timimbang-Botitian, we were discovered one Mud Volcano site within to the Fortune Estate which located more less 2 kilometers from Timimbang forest reserve part B and less 1.3 kilometer towards to Ulu Tungud forest reserve (see map 3). The mineral as we known is significant to provided diet concentrations to the large terrestrial mammals especially Elephant, Sambar deer and Wild pig. So, future forest management plan should be addressing this issue due some of the large mammals that classified as threatened species were detected and recorded visit to the source. Therefore, herbivores in the tropics are expected to depend strongly on natural licks (Matsubayashi, 2007)

## RECOMMENDATIONS

- ❑ The detection and identification of wildlife footprints was sometime difficult due to the type of the soil and the weather conditions. The assessment of the wildlife status within study areas could be more improve with using camera trap devices and conducting night spot.
- ❑ SFM Timimbang-Botitian forest reserve between Ulu Tungud and Bonggaya forest reserve an important landscape for the existed large terrestrial mammal corridor. The long term survival of the major mammals (such Bornean gibbon, sambar deer, clouded leopard and other primates) in SFM project areas (especially Botitian FR) is depending on the connectivity of their habitat. The effort should be initiated to highlight or to improve the connectivity of the forest landscape.
- ❑ Proper and regular survey activities need to be carried out especially to determine and understanding the status of the threatened species between three different areas in SFM project areas Timimbang-Botitian forest reserve.
- ❑ Strict enforcement “anti-poaching” to minimize illegal activities especially hunting in adjacent to SFM Timimbang-Botitian forest reserve.
- ❑ Undertake education and awareness programs for local communities those living in adjacent into project areas; promote cooperation of local communities through the Honorary Forest Ranger. The programs also extended to the nearest oil palm plantation and settlement surrounded the forest reserve.
- ❑ Undertake scientific expedition which is purposely to conduct full-scale wildlife inventory, involving both local people and international experts to verify the existence of threatened species (under IUCN redlist) and species under schedule (I) Wildlife conservation Enactment (WCE)
- ❑ Develop and promote ecotourism and explore options on how benefits can be transferred to local communities.
- ❑ The Timimbang forest reserve is still largely unexplored scientifically, and the fact that it could offer a valuable opportunity for the education of school and university groups, a small field study centre or simple laboratory has to be put in place.
- ❑ Long-term programs to monitor key species within SFM Timimbang-Botitian forest reserve should be implemented through systematic surveys throughout the project areas. Wildlife protection can be enhanced through educating local communities those living in adjacent to be more responsible and by soliciting their cooperation in maintaining the game species and other important species for the future.

- ❑ Systematic wildlife survey and monitoring programs must continue particularly those of important assets for tourism activities, like Bornean gibbon, Sambar deer, Sun bear, hornbills, Clouded leopard and etc.
- ❑ Undertake wildlife road kill's monitoring due the Botitian FR and Timimbang forest reserve (part A) is partly convenient to the main road. Placing speed limitation and wildlife signboard along the main road (Sapi Nangoh – Pitas) especially in adjacent to particular forest reserve.
- ❑ Wildlife management plan should be established specifically in SFM Timimbang-Botitian forest reserve because this area (especially in Timimbang part A and B) seen as significant areas and potential for HCVF.
- ❑ There is a need to develop and implement awareness activities to achieve a good coordination and cooperation with the land users bordering to the SFM Timimbang –Botitian FR boundaries. This campaign would provide a means to collect information about the occurrence and extent of conflict between wildlife and people.
- ❑ Hunting is strictly prohibited within forest reserve, so significant signboard such indicating boundary areas of forest reserve with heavy fines and penalties for hunting should be placed in strategic location.
- ❑ Consistently and continuous wildlife monitoring and survey should be conducted to gathering information in relation to wildlife presence (especially the large terrestrial mammals). Based on the current studies, wildlife monitoring by using camera traps devices is one significant method (besides recce walks and night spot) that can be used to obtain the presence information.
- ❑ Awareness programs should be consistently conducted with targeting at all settlement in adjacent to the forest reserve. The programs will be focus to informing the local communities and the plantations workers about the rules and regulations pertaining to forest offense and illegal hunting activities

## REFERENCES

- i. Auliya, M. 2007. *An identification guide to the tortoises and freshwater turtles of Brunei Darussalam, Indonesia, Malaysia, Papua New Guinea, Philippines, Singapore and Timor Leste*. Traffic Southeast Asia, Petaling Jaya, Malaysia
- ii. Azman Sakong, Eddie Ahmad, Zulirwan Takasi & Kassim Jikrun. 2008. Laporan Pemantauan Hidupan Liar Di Hutan Simpan Timimbang. Kinabatangan Orang Utan Conservation Project (KOCP), HUTAN.
- iii. Ancrenaz M., Azman S., Berjaya E. & Eddie A. 2008. Field report about the wildlife survey in Botition forest reserve. Kinabatangan Orangutan Conservation Project (KOCP), HUTAN. Kota Kinabalu.
- iv. CITES species database. <http://www.cites.org/eng/resources/species.html>. Retrieved **16 June 2014**
- v. Convention on International Trade in Endangered Species of Wild Fauna and Flora. *The CITES Appendices*. <http://www.cites.org/eng/app/index.php>. Retrieved **16 June 2014**
- vi. Mammals of Borneo. [http://en.wikipedia.org/wiki/Mammals\\_of\\_Borneo](http://en.wikipedia.org/wiki/Mammals_of_Borneo). Retrieved **16 June 2014**
- vii. IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. <[www.iucnredlist.org](http://www.iucnredlist.org)>. Retrieved **16 June 2014**
- viii. Mackinnon, J and Phillipps, K. (2008). *A field guide to the Birds of Borneo, Sumatra, Java and Bali*. Oxford University Press inc. New York.
- ix. Phillipps, Q. and Phillipps, K. 2011. *Phillipps' field guide to the Birds of Borneo*. Second edition, fully revised. Beaufoy publishing Ltd, Oxford, UK.
- x. Payne, J. C.M. Francis and K. Phillipps. 2005. *A field guide to the Mammals of Borneo*. The Sabah Society, Kota Kinabalu, Sabah.
- xi. Robert B. Stuebing and Robert F. Inger. 1999. *A field guide to the Snakes of Borneo*. Natural History Publication (Borneo), Kota Kinabalu, Sabah.
- xii. Phillipps, Q. and Phillipps, K. 2011. *Phillipps' field guide to the Birds of Borneo*. Second edition, fully revised. Beaufoy publishing Ltd, Oxford, UK.
- xiii. Payne, J. C.M. Francis and K. Phillipps. 2005. *A field guide to the Mammals of Borneo*. The Sabah Society, Kota Kinabalu, Sabah.
- xiv. Robert B. Stuebing and Robert F. Inger. 1999. *A field guide to the Snakes of Borneo*. Natural History Publication (Borneo), Kota Kinabalu, Sabah.



**Time Table**

Wildlife survey and monitoring programs in SFM Timimbang-Botitian forest reserve, 8<sup>th</sup> – 16<sup>th</sup> May 2014 and 22<sup>nd</sup> May 2014

<b>Date</b>	<b>Activities</b>
7 <sup>th</sup> May 2014	: Journey US-M to Lahad Datu / purchase of field equipments and other consumables before proceeding to Timimbang-Botitian Office
8 <sup>th</sup> May 2014	: Meeting and discussion with ADFO (Mr. Awang Azrul) and Timimbang-Botitian staff's (wildlife unit), briefing about the main activities and objective, road survey at Botitian FR and Timimbang FR (part A), conducting night drive to search nocturnal wildlife species
9 <sup>th</sup> May 2014	: From Timimbang-Botitian office to Botitian FR, recce walk (starting time 6:am), setting up two (2) units camera trapping, night drive at Timimbang FR (part A)
10 <sup>th</sup> May 2014	: Morning drive and recce walk at Timimbang FR (part A), setting up two unit's camera trap devices
11 <sup>th</sup> May 2014	: Timimbang-Botitian office – updating wildlife survey sheet\
12 <sup>th</sup> May 2014	: Timimbang-Botitian office to Timimbang FR (part B) base camp, conducting road survey, night drive, overnight at Timimbang part B base camp
13 <sup>th</sup> May 2014	: Timimbang FR (part B), recce walk and setting up two (2) units camera traps devices
14 <sup>th</sup> May 2014	: Journey Timimbang FR (part B) base camp to Timimbang-Botitian office
15 <sup>th</sup> May 2014	: Timimbang-Botitian office, updating wildlife observation sheet
16 <sup>th</sup> May 2014	: Journey Timimbang-Botitian office to Lahad Datu
22 <sup>nd</sup> May 2014	: Journey Sandakan to Timimbang-Botitian, inspect and collecting all camera traps devices that being installed within Timimbang-Botitian forest reserves

## Annex II – Night Spot Datasheet

Date: 8.5.2014

Activity: Night Spot

Weather Before: Good

Form: 1/2014

Team Recorder: Wildlife Unit (US-M&Tim-Botition)

Starting Point [GPS]: N 06 02 36.0 / E 117 17 11.9

Weather After: Good

Starting Time: 7:50 pm

Ending Point [GPS]: N 06 02 01.6 / E 117 16 41.8 (EP)

Survey Route: Botition Forest Reserve

Ending Time: 8:30 pm

Distance Covered (m): 1500m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						
1	100	7:49 PM	3	3	117 17 12.1	06 02 31.8	33	Botition	1	Thomas flying squirrel	1	GPS ID: P1
2	900	8:01 PM	3	3	117 16 50.7	06 02 11.4	35	Botition	1	Red giant flying squirrel	1	GPS ID: P2

Note \*:  
Habitat Type\*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian  
Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge , 6: Undulating  
Type of Sign\*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest

Date: 9.5.2014

Activity: Night Spot

Weather Before: Raining

Form: 1/2014

Team Recorder: Wildlife Unit (US-M&Tim-Botition)

Starting Point [GPS]: N 06 05 58.0 / E 117 13 18.7

Weather After: Drizzling

Starting Time: 7:45 pm

Ending Point [GPS]: N 06 07 04.7 / E 117 10 23.7

Survey Route: Timimbang Forest Reserve (Part A)

Ending Time: 8:41 pm

Distance Covered (m): 8700m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						
1	100	7:49 PM	3	3	117 13 14.0	06 05 56.9	355	Tim A	1	Leopard cat	1	GPS ID:035
2	1900	8:01 PM	3	3	117 12 33.4	06 05 36.1	482	Tim A	1	Malay civet	1	GPS ID:036
3	2100	8:03 PM	3	3	117 12 29.3	06 05 41.3	489	Tim A	1	Crested serpent eagle	1	GPS ID:037
4	2400	8:06 PM	3	3	117 12 22.4	06 05 45.1	498	Tim A	1	Leopard cat	1	GPS ID:038
5	3700	8:15 PM	3	3	117 11 48.5	06 05 58.3	489	Tim A	1	Thomas flying squirrel	1	GPS ID:039

Note \*:  
Habitat Type\*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian  
Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge , 6: Undulating  
Type of Sign\*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest

Date: 12.5.2014

Activity: Night Spot

Weather Before: Good

Form: 1/2014

Team Recorder: Wildlife Unit (US-M&Tim-Botition)

Starting Point [GPS]: N 05 59 35.7 / E 117 06 17.5 (075)

Weather After: Good

Starting Time: 8:00 pm

Ending Point [GPS]: N 05 59 47.0 / E 117 05 31.5 (076)

Survey Route: Timimbang Forest Reserve (Part B)

Ending Time: 8:22pm

Distance Covered (m): 2000m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						
No wildlife detection during survey, open area (degraded forest), Restoration Project area, Closest to OPP, speed limitation (15-20 km/hr), food availability												

Note \*:

Habitat Type\*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian

Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge, 6: Undulating

Type of Sign\*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest

### Annex III – Morning Drive Datasheet

Date: 10.5.2014  
 Team Recorder: RB, ZK, SA & YJ  
 Starting Time: 5:50 am  
 Ending Time: 7:04 am

Activity: morning drive  
 Starting Point [GPS]: N 06 05 58.0 / E 117 13 18.7  
 Ending Point [GPS]: N 06 07 04.7 / E 117 10 23.7  
 Distance Covered (m): 8700m

Weather Before: good  
 Weather After: good  
 Survey Route: Timimbang Forest Reserve (Part A)

Form: 1/2014

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						
1	220	6:02 AM	3	2	117 12 31.1	06 05 38.6	506	Tim A	1	Wreathed Hornbill	1	GPS ID: 041
2	3000	6:07 AM	3	2	117 12 09.1	06 05 58.8	537	Tim A	1	Red leaf monkey	4	GPS ID: 042
3	3000	6:09 AM	3	2	117 12 09.5	06 05 58.7	537	Tim A	4	Bornean gibbon		GPS ID: 043
4	3000	6:09 AM	3	2	117 12 09.5	06 05 58.7	537	Tim A	4	Rhinoceros hornbill		GPS ID: 043
5	3900	6:13 AM	3	2	117 11 44.7	06 06 01.3	503	Tim A	2	Wild pig		GPS ID: 044
6	3900	6:13 AM	3	2	117 11 44.7	06 06 01.3	503	Tim A	4	Great Argus		GPS ID: 044
7	4100	6:16 AM	3	3	117 11 39.5	06 06 02.9	482	Tim A	4	Great Argus		GPS ID: 045
8	4100	6:16 AM	3	3	117 11 39.5	06 06 02.9	482	Tim A	1	Crested serpent eagle	1	GPS ID: 045
9	4100	6:16 AM	3	3	117 11 39.5	06 06 02.9	482	Tim A	4	Rhinoceros hornbill		GPS ID: 045
10	4200	6:19 AM	3	3	117 11 37.2	06 06 04.2	469	Tim A	4	Great Argus		GPS ID: 046
11	4400	6:25 AM	3	3	117 11 32.4	06 06 10.0	444	Tim A	4	Rhinoceros hornbill		GPS ID: 047
12	4400	6:25 AM	3	3	117 11 32.4	06 06 10.0	444	Tim A	4	Great Argus		GPS ID: 047
13	4600	6:29 AM	3	3	117 11 29.1	06 06 14.6	446	Tim A	1	Bornean gibbon	3	GPS ID: 048
14	4600	6:34 AM	3	3	117 11 28.3	06 06 16.1	441	Tim A	4	Bornean gibbon		GPS ID: 050
15	4600	6:34 AM	3	3	117 11 28.3	06 06 16.1	441	Tim A	4	Great Argus		GPS ID: 050
16	4600	6:34 AM	3	3	117 11 28.3	06 06 16.1	441	Tim A	2	Barking deer		GPS ID: 050
17	4900	6:37 AM	3	3	117 11 27.2	06 06 17.5	442	Tim A	4	Rhinoceros hornbill		GPS ID: 051
18	5300	6:41 AM	3	3	117 11 22.9	06 06 26.8	428	Tim A	1	Crested serpent eagle	1	GPS ID: 052
19	5500	6:43 AM	3	3	117 11 19.8	06 06 38.1	397	Tim A	1	Wild pig	2	GPS ID: 053
20	5900	6:50 AM	3	3	117 11 17.9	06 06 48.1	349	Tim A	4	Great Argus		GPS ID: 054
Wildlife encountered:												
1	Oriental pied hornbill (4 ind), GPS ID:055, on the tree, vocalizing & flying											
Note *: Habitat Type*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian Slope: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge, 6: Undulating Type of Sign*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest												

## Annex IV – Recce Walks Datasheet

Date: 9.05.2014      Activity: recce walk      Weather Before: Good      Form: 1/2014  
 Team Recorder: Wildlife unit (USM & Tim-Boti)      Starting Point [GPS]: N06°01'19.0"E117°20'28.0"      Weather After: Good  
 Starting Time: 6:15 AM      Ending Point [GPS]: N06°00'53.9"E117°20'00.9"      Survey Route: Botitian FR (Class I)  
 Ending Time: 9:21 AM      Distance Covered (m): 1895m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					x_coor	y_coor						
1	150	6:31 AM	3	1	117°20'24.0"	06°01'19.3"	47	Botitian	2/8	Wild pig	##	GPS ID:024
2	284	6:48 AM	3	1	117°20'19.0"	06°01'15.5"	55	Botitian	2/13	Sambar Deer	#	GPS ID:025
3	348	6:55 AM	3	1	117°20'17.0"	06°01'15.7"	41	Botitian	4	Great Argus	#	GPS ID:026
4	454	7:06 AM	2	1	117°20'16.0"	06°01'14.9"	32	Botitian	2	Wild pig	##	GPS ID:027
5	511	7:14 AM	2	1	117°20'15.1"	06°01'12.3"	41	Botitian	2	Wild pig	##	GPS ID:028
6	561	7:19 AM	2	1	117°20'15.1"	06°01'12.3"	32	Botitian	2	Sambar Deer	#	GPS ID:029
7	761	7:39 AM	2	1	117°20'03.9"	06°01'08.4"	75	Botitian	2/10	Wild pig	##	GPS ID:030
Data from interviews (SFD Botitian):												
1	Sun bear (2008)											
2	Reticulated python (March 2014)											
3	Bornean gibbon (vocalizing)											
Note *: Habitat Type*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian Slope/Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge, 6: Undulating Type of Sign*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest, 13-horn marked												

Date: 10.05.2014      Activity: Recce walk      Weather Before: Good      Form: 1/2014  
 Team Recorder: Wildlife unit (USM & Tim-Boti)      Starting Point [GPS]: N06°04'10.9"E117°15'03.4" (056)      Weather After: Good  
 Starting Time: 10:02 AM      Ending Point [GPS]: N06°04'09.3"E117°14'46.1" (074)      Survey Route: Timimbang A FR (Class II)  
 Ending Time: 1:04 PM      Distance Covered (m): 1650m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					x_coor	y_coor						
1		10:12 AM	2	1	117°15'05.2"	06°04'13.3"	90	Tim A	4	Great Argus	#	GPS ID:057
2		10:12 AM	2	1	117°15'05.2"	06°04'13.3"	90	Tim A	4	Bornean gibbon	#	GPS ID:057
3		10:24 AM	2	1	117°15'00.5"	06°04'17.7"	108	Tim A	13	Sambar Deer	#	GPS ID:058
4		10:24 AM	2	1	117°15'00.5"	06°04'17.7"	108	Tim A	4	Great Argus	#	GPS ID:058
5		10:29 AM	2	1	117°14'58.5"	06°04'17.8"	116	Tim A	1	Bornean gibbon	2	GPS ID:059
6		10:37 AM	2	1	117°14'56.5"	06°04'18.7"	125	Tim A	4	Great Argus	#	GPS ID:060
7		10:39 AM	2	1	117°14'56.1"	06°04'18.6"	128	Tim A	4	Great Argus	##	GPS ID:061

8		10:57 AM	2	1	117 14 55.1	06 04 19.1	137	Tim A	4	Great Argus	#	GPS ID:062
9		10:59 AM	2	1	117 14 54.3	06 04 19.4	139	Tim A	8	Wild pig	#	GPS ID:063
10		11:37 AM	2	1	117 14 49.5	06 04 25.0	140	Tim A	1	Bornean gibbon	1	GPS ID:065
11		11:42 AM	2	1	117 14 49.1	06 04 26.6	134	Tim A	8	Wild pig	#	GPS ID:066
12		11:51 AM	2	1	117 14 49.9	06 04 28.7	122	Tim A	7	Sun bear	#	GPS ID:067
13		11:51 AM	2	1	117 14 49.9	06 04 28.7	122	Tim A	4	Rhinoceros hornbill	#	GPS ID:067
14		11:59 AM	2	1	117 14 50.3	06 04 28.7	124	Tim A	4	Bornean gibbon	#	GPS ID:068
15		12:13 PM	2	1	117 14 48.0	06 04 24.9	115	Tim A	2/10	Wild pig	##	GPS ID:069
16		12:18 PM	2	1	117 14 48.4	06 04 24.8	127	Tim A	7	Sun bear	#	GPS ID:070
17		12:21 PM	2	1	117 14 49.2	06 04 24.7	142	Tim A	2/10	Wild pig	##	GPS ID:071, active wallow
18		12:33 PM	2	1	117 14 47.4	06 04 19.3	100	Tim A	7	Clouded leopard	#	GPS ID:072
19		1:00 PM	2	1	117 14 42.0	06 04 12.0	42	Tim A	2/3	Wild pig	##	GPS ID:073

\* Human sign (old cutting sign) found during the survey, could be poachers

Data from interviews (SFD Botitian):

1 Orangutan, 2007 (walking on the ground)

Note \*:

Habitat Type\*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian

Slope/Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge, 6: Undulating

Type of Sign\*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest, 13-horn marked

Date: 13.5.2014

Activity: recce walk

Weather Before: Good

Form: 1/2014

Team Recorder: Wildlife Unit (US-M&Tim-Botitian)

Starting Point [GPS]: N 05 59 35.7 / E 117 06 17.5 (075)

Weather After: Good

Starting Time: 6:00 am

Ending Point [GPS]: N 05 59 47.0 / E 117 05 31.5 (076)

Survey Route: Timimbang B (class II) - old logging road

Ending Time: 7:53 am

Distance Covered (m): 2000m

No	Dist on the Road (m)	Time (12hrs)	Topo*	Habitat Type*	GPS Location		Alt (m)	Area/Cpt	Type of Sign*	Wildlife Species	No. of Object	Note (age, sex, food plants, tree species, etc)
					X_coor	Y_coor						
1		6:05 AM	2	1 (open)	117 06 17.2	05 59 35.8	86	Tim B	calling	Bornean gibbon	#	GPS ID: 077
2		6:09 AM	2	1 (open)	117 06 13.3	05 59 35.5	88	Tim B	sighted	Long tailed macaque	3	GPS ID:078
3		6:13 AM	2	1 (open)	117 06 09.8	05 59 35.3	91	Tim B	calling	Bornean gibbon	#	GPS ID:079, heard from the road
4		6:17 AM	2	1 (open)	117 06 05.3	05 59 32.3	87	Tim B	prints	Wild pig	##	GPS ID:080, fresh prints
5		6:20 AM	2	1 (open)	117 06 05.0	05 59 32.4	86	Tim B	prints	Common palm civet	1	GPS ID:081, fresh print
6		6:23 AM	2	1 (open)	117 06 04.5	05 59 32.1	85	Tim B	prints	Sambar deer	1	GPS ID:082, fresh print
7		6:27 AM	2	1 (open)	117 06 00.0	05 59 29.6	80	Tim B	calling	Great Argus	#	GPS ID:083
8		6:29 AM	2	1 (open)	117 05 59.1	05 59 29.1	79	Tim B	prints	Wild pig	#	GPS ID:084, fresh prints
9		6:30 AM	2	1 (open)	117 05 58.7	05 59 29.2	78	Tim B	prints	Sambar deer	#	GPS ID:085, fresh prints
10		6:35 AM	2	1 (open)	117 05 57.3	05 59 28.4	79	Tim B	prints	Wild pig	##	GPS ID:086, fresh prints
11		6:37 AM	2	1 (open)	117 05 55.0	05 59 28.2	87	Tim B	sighted	Black hornbill	3	GPS ID:087, resting and flying

12		6:40 AM	2	1 (open)	117 05 52.7	05 59 29.7	81	Tim B	prints	Wild pig	##	GPS ID:088, frsh prints
13		6:46 AM	2	1 (open)	117 05 48.2	05 59 26.9	93	Tim B	sighted	Black hornbill	1	GPS ID:089
14		6:48 AM	2	1 (open)	117 05 50.0	05 59 28.5	94	Tim B	Dung	Bornean elephant	#	GPS ID:090, only one ind.
15		6:51 AM	2	1 (open)	117 05 47.9	05 59 26.6	91	Tim B	prints	Wild pig	#	GPS ID:091, fresh prints
16		6:51 AM	2	1 (open)	117 05 47.9	05 59 26.6	91	Tim B	calling	Great Argus	#	GPS ID:091
17		6:53 AM	2	1 (open)	117 05 46.8	05 59 25.8	90	Tim B	prints	Sambar deer	2	GPS ID:092, infant + mother (fresh prints)
18		6:58 AM	2	1 (open)	117 05 46.6	05 59 24.6	90	Tim B	Dung	Civet sp.	1	GPS ID:093
19		7:02 AM	2	1 (open)	117 05 43.9	05 59 24.8	90	Tim B	calling	Great Argus	#	GPS ID:094, heard from the road
20		7:04 AM	2	1 (open)	117 05 42.4	05 59 24.1	89	Tim B	prints	Wild pig	##	GPS ID:095, fresh prints
21		7:06 AM	2	1 (open)	117 05 38.2	05 59 23.8	90	Tim B	sighted	Crested serpent eagle	1	GPS ID:096
22		7:09 AM	2	1 (open)	117 05 37.4	05 59 25.9	93	Tim B	prints	Wild pig	#	GPS ID:097
23		7:17 AM	2	1 (open)	117 05 37.3	05 59 26.8	88	Tim B	prints	Malay badger	1	GPS ID:098
24		7:17 AM	2	1 (open)	117 05 37.3	05 59 26.8	88	Tim B	calling	Great Argus	1	GPS ID:098, heard from road
25		7:23 AM	2	1 (open)	117 05 38.3	05 59 29.9	112	Tim B	print	Bornean elephant	1	GPS ID:099
26		7:23 AM	2	1 (open)	117 05 38.3	05 59 29.9	112	Tim B	calling	Bornean gibbon	1	GPS ID:099
27		7:28 AM	2	1 (open)	117 05 36.0	05 59 33.4	101	Tim B	prints	Leopard cat	1	GPS ID:100, small print with 4 toes
28		7:32 AM	2	1 (open)	117 05 34.7	05 59 34.2	90	Tim B	sighted	Oriental pied hornbill	2	GPS ID:101
29		7:32 AM	2	1 (open)	117 05 34.7	05 59 34.2	90	Tim B	prints	Wild pig	##	GPS ID:101
30		7:35 AM	2	1 (open)	117 05 33.7	05 59 35.5	91	Tim B	calling	Bornean gibbon	##	GPS ID:102, heard from the road
31		7:38 AM	2	1 (open)	117 05 33.9	05 59 37.0	92	Tim B	print	Leopard cat	1	GPS ID:103
32		7:38 AM	2	1 (open)	117 05 33.9	05 59 37.0	92	Tim B	calling	Great argus	#	GPS ID:103
33		7:40 AM	2	1 (open)	117 05 33.4	05 59 38.6	94	Tim B	print	Wild pig	##	GPS ID:104
34		7:43 AM	2	1 (open)	117 05 32.0	05 59 42.8	105	Tim B	prints	Wild pig	##	GPS ID:105
35		7:48 AM	2	1 (open)	117 05 31.9	05 59 46.6	89	Tim B	print	Bearcat / Binturong	1	GPS ID:106
36		7:48 AM	2	1 (open)	117 05 31.9	05 59 46.6	89	Tim B	prints	Wild pig	##	GPS ID:106

\* found flatform (GPS ID:101, less one month old-poacher)

Note \*:

Habitat Type\*: 1- Lowland (< 500m), 2- Upland (>500m), 3- Dry Lowland, 4- Open Area, 5- Semi Inundated, 6- Swamp, 7- River, 8- Riparian

Topo: 1: Flat, 2: 0-10°, 3: 10°-45°, 4: >45°, 5: Top Ridge, 6: Undulating

Type of Sign\*: 1- Direct Sighting, 2- footprint, 3- dung, 4- Calling, 5- Feeding Sign, 7- Claw Mark, 8- Mud Rubbing, 9- Urine, 10- Wallow, 11- Twisted, 12- Nest

### Annex V – Opportunistic Wildlife Sighting

Recorder	Date	Time (12hrs)	Type of sign's	Wildlife Species	No. of detection	Weather*	Habitat Type*	Canopy Cover	GPS Coordinate		Alt (m)	Area / Cpt	Sex*	Age*	Note
									X_coor	Y_coor					
US-M wildlife team	7.05.2014	6:15 PM	DS	PTM	> 10 Ind.	good							unknown	unknown	near Timimbang-Botitian office
US-M wildlife team	8.05.2014	6:55 AM	calling	Bornean gibbon	1	good							unknown	unknown	heard from T-B office
US-M wildlife team	8.05.2014	6:55 AM	calling	Great argus	1	good									
US-M wildlife team	8.5.2014	7:46 PM	sighting	wild pig	2	good	OPP					Botition		adult	sight before night spot
Tim-Boti & US-M	8.5.2014	8:35 PM	sighting	slow loris	1	good	1		117 17 04.5	06 02 21.8		Botition	unknown	Juv.	sight after night spot (gps id:P3)

*Note\* Wildlife species that need to records:*

i. Carnivores - Bay cat, Clouded Leopard, Marble Cat, Sun Bear, Oriental Small - Clawed Otter, Binturong & Otter Civet

ii. Pangolin

iii. Pygmy elephant

iv. Rhino

v. Birds - All Hornbill Species

vi. Primates - Red leaf monkey, Grey leaf monkey, Slow Loris, Western tarsier, Orang Utan, Proboscis monkey, Pig tailed macaque, Long tailed macaque & Silvered langur

vii. Ungulates - Tembadau, Mouse Deer, Sambar deer & Muntjac/Barking deer









**Annex VI – Camera Trapping**

CT ID Number	X_Coor	Y_Coor	Location / Area/Cpt	Date set-up	Date checked	Disturbed	Battery (%)_Old	Battery (%)_New	No. of Photo	Wildlife Species	No. of Images	Percentage %	Note
Boti CT1	117 19 57.5	06 00 59.0	Botition FR	9.5.2014	22.05.2014	nill	66	98	14	Nil	0	0.00	GPS ID:031, old l.road (ridge), CT-USM
Boti CT2	117 20 27.8	06 01 21.6	Botition FR	9.5.2014	22.05.2014	nill		-	138	Pig tailed macaque	112	81.16	GPS ID:033, ridge, CT-Tim
										none	26	18.84	
Timi (A) CT 1	117 12 32.2	06 05 30.8	Timimbang A	10.5.2014	22.05.2014				20	Bearded pig	5	25.00	GPS ID:055, old logging road, CT-USM
										none	15	75.00	
Tim (A) CT 2	117 14 53.8	06 04 20.4	Timimbang A	10.5.2014	22.05.2014	yes		-	808	Malay civet	4	0.50	GPS ID:064, top ridge, CT-Tim
										Mouse deer	4	0.50	
										Great argus	496	61.39	
										Pig tailed macaque	143	17.70	
										Bearded pig	13	1.61	
										none	147	18.19	
Tim (B) CT1	117 05 36.3	05 59 26.8	Timimbang B	13.5.2014	21.05.2014	nill	40	84	20	Pig tailed macaque	12	60.00	GPS ID:107, wildlife trail, CT-USM
										Sun bear	3	15.00	
										none	5	25.00	
Tim (B) CT2	117 05 35.5	05 59 26.7	Timimbang B	13.5.2014	21.05.2014	nill		-	32	Wild pig	14	43.75	GPS ID:108. wildlife trail, CT-Tim
										Pig tailed macaque	2	6.25	
										none	16	50.00	
Tim (B) CT3	117 05 51.3	05 59 26.8	Timimbang B	13.5.2014	21.05.2014	nill		-	18	Barking deer	2	11.11	GPS ID:109, ridge (old l. road), CT-Tim
										Mouse deer	2	11.11	
										Sambar deer	2	11.11	
										none	12	66.67	

Lower risk categories		
2001 Categories & Criteria (version 3.1)	Description	1994 Categories & Criteria (version 2.3)
<p>Extinct EX EW</p> <p>Threatened CR EN VU</p> <p>Least Concern NT LC</p>	<p><b>Least Concern (LC or LR/lc)</b>, lowest risk. Does not qualify for a more at risk category. Widespread and abundant taxa are included in this category.</p>	<p>Extinct EX EW</p> <p>Threatened CR EN VU</p> <p>Lower Risk cd nt lc</p>
<p>Extinct EX EW</p> <p>Threatened CR EN VU</p> <p>Least Concern NT LC</p>	<p><b>Near Threatened (NT or LR/nt)</b>, is close to qualifying for or is likely to qualify for a threatened category in the near future.</p>	<p>Extinct EX EW</p> <p>Threatened CR EN VU</p> <p>Lower Risk cd nt lc</p>
<p><i>No longer a Red List category</i></p>	<p><b>Conservation Dependent (LR/cd)</b>, the focus of a continuing taxon-specific or habitat-specific conservation program targeted towards the taxon in question, the cessation of which would result in the taxon qualifying for one of the threatened categories below within a period of five years.</p>	<p>Extinct EX EW</p> <p>Threatened CR EN VU</p> <p>Lower Risk cd nt lc</p>

### Threatened categories

2001 Categories & Criteria (version 3.1)	Description	1994 Categories & Criteria (version 2.3)
	<p><b>Vulnerable (VU)</b>, considered to be facing a high risk of extinction in the wild</p>	
	<p><b>Endangered (EN)</b>, considered to be facing a very high risk of extinction in the wild.</p>	
	<p><b>Critically Endangered (CR)</b>, facing an extremely high risk of extinction in the wild.</p>	

Other categories		
2001 Categories & Criteria (version 3.1)	Description	1994 Categories & Criteria (version 2.3)
	<b>Extinct in the Wild (EW)</b> , known only to survive in cultivation, in captivity or as a naturalized population (or populations) well outside the past range.	
	<b>Data Deficient (DD)</b> , inadequate information to make a direct, or indirect, assessment of its risk of extinction.	
	<b>Not Evaluated (NE)</b> , not yet been evaluated against the criteria.	
	<b>Possibly Extinct (PE)</b> , a category given by Birdlife International. A subcategory of CR.	
	<b>Possibly Extinct in the Wild (PEW)</b> , A term used within the IUCN Red List. A subcategory of CR.	
<a href="Image:Status iucn3.1 PLC.svg">Image:Status iucn3.1 PLC.svg</a>	<b>Possibly Least Concern (PLC)</b> , Used for a term within the IUCN Yellow List. A subcategory of NT.	<a href="Image:Status iucn2.3 PLC.svg">Image:Status iucn2.3 PLC.svg</a>
	<b>Extinct (EX)</b> , there is no reasonable doubt that the last individual has died.	

□ Some photos during the field work activities in SFM Timimbang – Botitian FR

i. Setting – up camera trapping



ii. Recce walk (Morning) – data recording



iii. Birds watching



□ Some photos of wildlife presences were recorded in SFM Timimbang-Botitian FR

i. Leopard Cat *Felis bengalensis*



ii. Claw mark (Sun Bear)



iii. Wallow (Wild pig & Sambar deer prints recorded)



iv. Dung (Bornean elephant, *Elephas maximus*)



iv. Bornean gibbon *Hylobates muelleri*



v. Crested serpent eagle *Spilornis cheela*



vi. Wreathed hornbill *Rhyticeros undulatus*



☐ Wildlife photos being photographed by using camera traps within SFM Timimbang-Botitian FR

i. Bearded pig *Sus Barbatus*



ii. Sun Bear *Helarctos malayanus*



iii. Sambar deer *Cervus unicolor*





iv. Barking deer *Muntiacus sp.*



v. Mouse deer *Tragulus sp*



vi. Pig tailed Macaque *Macaca nemestrina*



vii. Great Argus *Argusianus argus*

