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# **RESULTS OF STATUS ASSESSMENT OF FRANCOIS LANGUR AND OTHER PRIMATES IN TAM DAO NATIONAL PARK (10-28 November 2006)**

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### **Tam Dao National Park and Buffer Zone Management Project**

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## TABLE OF CONTENT

<b>Executive Summary</b>	3
<b>1. Introduction</b>	5
<b>2. Methodology</b>	6
2.1. Village and Rangers interviews	6
2.2. Selection of survey site	6
2.3. Field survey	7
2.4. Survey effort	9
2.5. Training technical staff of Tam Dao NP	10
<b>3. Results and discussion</b>	11
3.1. Interview information about francois langur and other primates	11
3.2. Field investigation information about Francois langur and other primates	11
3.3. Threats to Primate fauna	15
3.4. Records of other mammals	16
3.5. Results of staff training	16
<b>4. Recommendation</b>	17
<b>Illustration pictures</b>	18
<b>Reference</b>	23
<b>Annex 1: Term of Reference</b>	24
<b>Figure 1: Arrangement of survey transects in Ao Dua – Thach Ban – Thien Thi – Rung Rinh Area</b>	8
<b>Figure 2: Localities of Primate records in surveyed area</b>	13

## **EXECUTIVE SUMMARY**

**This specific primate survey with focus on Francois langur (*Trachypithecus francoisi*) was conducted from 10 to 28 November 2006, including 2 phases: Interview of local villagers and forest rangers from 10 – 12 November 2006 and field investigation from 13 – 28 November 2006.**

**Totally, about 90 people from 11 villages and 8 TDNP forest rangers have been interviewed. The interviewees reported existence of 5 primate species and possible existence of small population of Francois langur in an area from Ao Dua (Dao Tru commune) to Rung Rinh mountain (Quan Chu commune). This area was taken for extensive field investigation.**

**The effort of the field investigation consists of 12 days for active primate search with 14 transects of total 139 km long and 53 watching hours at 3 watching points. Very little information primate species could be obtained.**

**Before 1980, Francois langur was very common in the Park (reported by local interviewees). In 1992-1993, the francois langur population was estimated for only 40-120 individuals (Do Tien Long, 1992 and FIPI, 1993). In 1998, Cao Van Sung et al. (1998) noted very low number of the langur population while hunting pressure remained very high. Nguyen Xuan Dang et al. (2005) could not obtain any direct sighting of Francois langur during their surveys in 2004 and 2005, though, local informants reported a small group in Thien Thi – Thach Ban area.**

**This survey could not get any direct sighting of the Francois langur in the Park, only a single dung pile possibly of Francois langur was found in North Ao Dua area which is not enough to confirm the existence of species. Francois langur very likely have been extirpated from Tam Dao NP or remains only in very few individuals (possibly, less than 10 individuals).**

**The existence of Rhesus macaque and stump-tailed macaques was confirmed in this survey by direct sighting, however, very low sighting rate (1 sightings per 12 days of active search in 14 transects with total of 139 km and 53 hours of point watching) and small number of animals in each sighted groups (less than 10 individuals) indicate their very low number remained. Existence of Pig-tailed macaque and Assamese macaque in Tam Dao NP could not be confirmed and their number is obviously very low if some remain.**

**Tam Dao NP still support one of the most extensive, contiguous tracts of lowland, lower montane and bamboo forests in Northern Vietnam. Good tall forests which can provide primates with rich food source and good refuge still occur in large area of the Park. Main current threats to primate fauna as well as other wildlife species are wildlife hunting, trapping and habitat disturbance. In order to conserve Primate fauna in Tam Dao NP following measures are recommended:**

- 1. Control of wildlife hunting, trapping, trading and forest disturbance**
- 2. Monitoring of primate populations in the Park**
- 3. Re-introduction of confiscated primates into the Park**

**One technical staff of Tam Dao NP and one forest ranger from Tam Dao FPU received on-job training on Primate survey techniques and recording of species-specific information. Before the survey, the trainees were offered a brief knowledge about status and ecology of Fancois langur and other primate species which occur in Tam Dao NP, the approaches to conserve these globally threatened species and techniques for their status assessment. Then, trainees participated in all survey activities to get on-job training. The trainees have obtained basic training knowledge, however, they need more training to improve their survey skills.**

## **ABBREVIATION**

GPS – Global Position System  
IEBR – Institute of Ecology and Biological Resources  
IUCN – World Conservation Union  
FIPI – Forest Investigation and Planning Institute  
FPU – Forest Protection Unit  
NP – National Park  
NTFP – Non-timber forest products  
TDMP – Tam Dao National Park and Buffer Zone Management Project  
VND – Vietnam Dong

IUCN Red List of Threatened Species:

CR – Critical  
EN – Endangered  
VU – Vulnerable  
DD – Data deficient  
LRnt – Low risk, near threatened

Vietnam Red Data Book (2000):

E – Endangered  
V – Vulnerable  
R – Rare  
T – Threatened

**Note:** Actual GPS readings in the field not corresponds to UTM coordinate on Map provided by TDMP. Example: actual field readings are 0564064; 2377837, in the map should be 0564064; 237837

## I. INTRODUCTION

Tam Dao Nature Reserve was gazetted in 1977 by Decision No. 41/TTg, dated 24 January 1977 of Prime-Minister and up-graded into Tam Dao National Park (TDNP) in March 1996, by Decision No. 136/TTg, dated 6 March 1996 of Prime-Minister. Total area of TDNP is 34,995 ha. Management board of Tam Dao NP was established in May 1996. Main habitats in Tam Dao NP are lowland and montane tropical evergreen forests which can support very high faunal diversity (Tordoff et al. 2004).

Francois langur (*Trachypithecus francoisi*) is listed in Red Data Book of Vietnam and 2006 IUCN Red List as Vulnerable, though, its conservation status must be as critically endangered (CR) in Vietnam and endangered (EN) in the World (Nadler et al., 2003). The range of Francois langur is limited to South China and Northern Vietnam. In China, the species is widely distributed throughout the South China, but its range is highly fragmented (Zhang et al., 1992, in Nadler et al., 2003).

In Vietnam, historical range of Francois langur includes Ha Giang, Cao Bang, Bac Kan, Thai Nguyen, Tuyen Quang, Lao Cai and Yen Bai Province. However, it seems to have been extirpated from most of its original distribution and can now only be found in isolated forest fragments. The total number is estimated to be less than 300 individuals divided into at least 10 populations with no populations containing more than 50 individuals. This gives high challenge of Francois langur conservation.

Francois langur has been recorded in Tam Dao NP by several studies (Do Tien Long (1992), FIPI (1993) and Cao Van Sung et al. (1998). However, their abundance rapidly reduces. Survey of Nguyen Xuan Dang and his collaborators in 2004-2005 could not get any direct sighting of the species, however, its existence was reported by local hunters (Nguyen Xuan Dang et al., 2005). Given high extinction risk of Francois langur in the World, any its extant population should receive high conservation priority.

This specific primate survey was conducted in November 2006, under framework of “*Tam Dao NP and Buffer Zone Management Project*” (GTZ Office Vietnam) to assess population status of Francois Langurs and other primate species in Tam Dao NP for their relevant conservation measures. The specific objectives of this survey are to:

1. Assess the population size, population composition, distribution, and habitat of Francois Langur.
2. Obtain information about status of other primate species in survey area.
3. Train 2 technical staffs of Tam Dao NP on assessment techniques.
4. Determine follow-up actions required for recovering/ protecting and monitoring the langur population

***The project team members would like to express their sincere thank to Tam Dao National Park and Buffer Zone Management Project, especially Mr. Herbert Chris for financial support and valuable instructions for the project implementation; to Management Board of Tam Dao National Park, especially, Director Mr. Do Dinh Tien; to People Committee and residents of all communes in buffer zone of Tam Dao National Park for their support and kind help; and to Leadership of Institute of Ecology and Biological Resources for allowing us to participate in this Project.***

## II. METHODOLOGY

The survey methodology includes interview of local villagers and rangers, and field survey at selected areas. Survey team includes two principle investigators from Institute of Ecology and Biological Resource (IEBR), one technical staff member from Tam Dao NP and one forest ranger from Tam Dao District Forest Protection Unit (FPU):

1. Dr. Nguyen Xuan Dang – Mammalogist, IEBR, Team leader
2. Mr. Nguyen Xuan Nghia – Mammalogist, IEBR
3. Mr. Phan Tien Long - Technical staff, Tam Dao NP - Trainee
4. Mr. Nguyen Duc Long – Forest ranger, Tam Dao Forest Protection Unit - Trainee

### 2.1. Village and Rangers interviews

Two types of interview was employed: group meetings conducted as participatory primate assessments and focused interviews with single or small groups of people identified as having expert knowledge of the Tam Dao NP (particularly knowledgeable elders who may have hunted in the area in the past). These meetings were aimed at obtaining up-to-date information on the status of primates in the Tam Dao NP, trends in abundance of primates and local exploitation of primates for food or for sale.

The village and rangers interview was carried from 10-12 November 2005 in 11 villages of 6 communes, Tam Dao Town and 5 forest protection stations of Tam Dao NP. Six interviewed communes are: Quan Chu (Hoa Binh II, Chiem villages and Quan Chu Townlet), Cat Ne (Tan Phu village), Hop Hoa (Dong Phai), Dao Tru (Vinh Ninh and Phan Lan villages), Dai Dinh (Dong Thong, Long Sau villages), Tam Quan (Dong Bua, Yen Trung villages) and Tam Dao town. Four interviewed forest protection stations are Hop Hoa, Dao Tru, Tam Quan and Tam Dao Town Stations.

During the interview, the informants were requested to answer question about the status of Primates in Tam Dao NP from general to more detail with showing as many evidences as possible, such as skin, bone, new tracks, number of persons know the same information, date and place of the information occurrence. Colour pictures of animals were used to help clarify taxonomic identification of target species in the end of discussion. The selection of target areas for field survey was based on information received from village and rangers interviews.

Totally, about 90 people have been interviewed including 8 Tam Dao NP forest rangers. The villagers were once extensive exploitators of forest products: wildlife hunting, timber extraction, NTFPs harvesting, etc. Out of them, about 40 people have good knowledge on mammals of Tam Dao area, as they were extensive hunters in the past. However, only 16 persons could provide some information about primates in the Park during recent 10 years, other claims that they have stopped to go into deep forest for many years.

### 2.2. Selection of survey site

All village interviewees reports that before 1980, Francois langur was common in Tam Dao NP. They could be found in many areas of the Park, especially in Suoi Tram – Suoi

Tien up-stream (Hop Hoa, Thien Ke, La Bang Communes), Ngoi Lanh up-stream – Tam Dao North Mountain (Dao Tru, Hoang Nong commune), Ao Dua – Thach Ban – Thien Thi – Rung RinH mountain (Dao Tru, Dai Dinh, Ky Phu, Quan Chu commune) and Mo Qua Ha area (Trung My Commune). However, the hunting has eliminated Francois langur from most of the Park territory.

There is very little information about the possible existence of the species in Tam Dao NP and the population is reported to occur in an area ranging from Ao Dua to Rung RinH peak (see paragraph III below for details). Our survey in 2005 also obtained only interview information about small group of Francois langur in Thien Thi (= Phu Nghia) peak (Nguyen Xuan Dang et al., 2005). Based on these information we decided to conduct field survey for Francois langur and other primates in Ao Dua – Rung RinH Area (Fig. 1).

This area is located in forest compartments 95, 97, 393 and 395 covering both Eastern and Western slopes of main Tam Dao Range (Vinh Phuc and Thai Nguyen Province). The area is characterized by system of high mountains (up to 1400 m a.s.l) with very steep slopes such as Thien Thi, Thach Ban and Rung RinH Mountains. Elevation ranges from 400-1400m a.s.l. The forests in elevation above 700 m a.s.l are in quite good status. Dominant forest types are mixed wood-bamboo forest with tall trees. There are also patches of pure small bamboo forest or tall wood forests.

The investigation was conducted at elevation of above 900m a.s.l because below this elevation the forests are much disturbed by human activities (villages, human encroachment, cattle raising, road construction, etc.).

### **2.3. Field survey**

- *Transect survey*

Transect techniques were used to record direct observation of wildlife and indirect observation through wildlife activity signs (tracks, dropping, vocalization, etc.). Survey transects passed through various habitat types of each survey sites and with distance of 5-10 km each. Because of very steep terrain and thick forest in survey sites, some existing small trails running through various habitat types were used as the survey transects, but most of survey effort was spent in off-trail areas as far as possible. Extensive surveys used the rapid assessment technique (various different extensive surveys from a camp, rather than repeated walks of the same transect) to cover a lot of ground quickly. Equipment for wildlife observation and recording include binoculars, cameras, pens, field books and pre-prepared data sheets.

- *Point watching*

Several points of good view of forest in Thai Nguyen slope which are of high possibility of Francois langur occurrence were selected for continuous watching from early morning to darkness to expect direct sighting of the langurs.

- *Field note taking*

For each encounter (direct or indirect) with a primates (or any other species of interest), the following information were recorded: date and time, GPS location, altitude, local

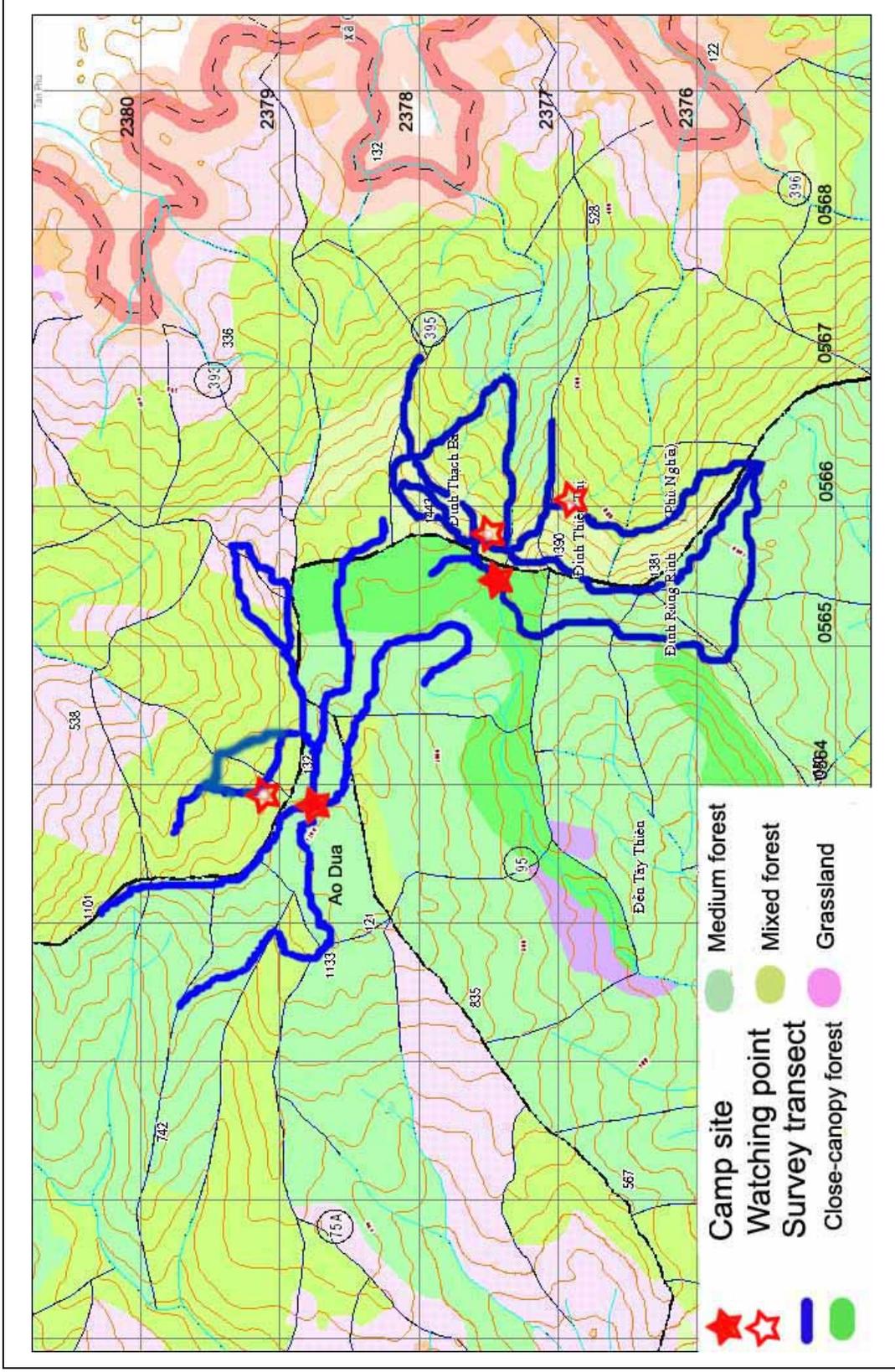


Figure 1: Arrangement of survey transects in Ao Dua – Thach Ban – Thien Thi – Rung Rin area

habitat type (bamboo forest, secondary evergreen forest, primary evergreen forest, primary forest on limestone, sub-montane forest, riverine forest, open water, etc.), species encountered, means of identification (direct sighting, tracks, food remains, etc.).

- *Species identification manuals*

Following manuals were used for species identification of large mammals: “Mammals of Thailand”. Bangkok by Lekagul et al., 1977 and “Field Guide to the Key Mammal Species of Phong Nha-Ke Bang”, Hanoi by Pham Nhat and Nguyen Xuan Dang, 2000:

#### 2.4. Survey effort

Field survey was conducted from 13 – 28 November 2006 with two camp sites:

- Camp 1 at Thien Thi-Thach Ban pass (0565390; 2376465; alt. 1116m), from 13 to 20 November 2006 with 7 days of active primate searching
- Camp 2 at North of Ao Dua area (0563867; 2377745, alt.1230m), from 23 to 28 November 2006 with 5 days of active primate searching.

From these camp sites, 14 transects were made with total transect length of about 139 km and 53 hours of watching at 3 watching points were conducted (Table 1). Location of all transects and watching points are shown in Fig. 1

**Table 1: Effort of primate survey in Tam Dao National Park**

<b>Camp site</b>	<b>Coordinates</b>	<b>Total transect length</b>	<b>Total watching time</b>
<b>Camp 1</b> (Thien Thi-Thach Ban Pass)	0565390; 2376465 alt. 1116m	77 km	33 hours
<b>Camp 2</b> (North of Ao Dua)	(0563867; 2377745, alt.1230m)	62 km	20 hours
<b>Total:</b>		<b>139 km</b>	<b>53 hours</b>

Location of 3 watching points are: Thai Nguyen slope of Thach Ban Peak (0565578; 2376256 alt. 1220m); Thai Nguyen slope of Thien Thi Peak (0565722;2376005 alt. 1153m) and Thai Nguyen slope near Ao Dua (0563892; 2378093, alt. 1327).

From Camp 1, eight (8) transects were made with total transect length of about 77 km long:

- Transect 1: from Camp to the South, following western slopes of Thien Thi and Rung Rinh mountains and back, total survey length is about 14 km.
- Transect 2: from Camp to the Southeast, following Thai Nguyen slope of Thien Thi mountain to Dong Sen and Da Kep forest and back, total length is about 8 km.
- Transect 3: from Camp to the Northeast following Thai Nguyen slope of Thien Thi and Thach Ban mountains and back, total length is about 10 km.

- Transect 4: from Camp to the South, through the peaks of Thien Thi and Rung Rinh mountains and back, total length is about 10 km.
- Transect 5: from Camp to the East, following Thai Nguyen Slope of Thach Ban mountain and back, total length is about 8 km.
- Transect 6: from Camp to the South, following Thai Nguyen Slope of Thien Thi and Rung Rinh mountains and back, total length is about 12 km.
- Transect 7: from Camp to the Northeast, following Thai Nguyen Slope of Thach Ban Mountain, total length is about 8 km.
- Transect 8: from Camp to the North, following western slope of Thach Ban mountain and back, total length is about 7 km.

From Camp 2, Six (6) transects were made with total transect length of about 62 km long:

- Transect 1: from Camp to the Southwest to head of Tay Thien Stream and back, total length of about 12 km.
- Transect 2: from camp Eastwards and Southward, following mountain ridge to Thach Ban Peak and back, total length of about 10 km.
- Transect 3: from camp Northwards to Peak 1101 and back, total length of about 12 km.
- Transect 4: from camp following Northeast direction in Dao Tru slope and back, total length of about 10 km.
- Transect 5: from camp following Northwest direction in Thai Nguyen slope and back, total length of about 9 km
- Transect 6: from camp Westwards in Thai Nguyen Slope and Back, total length of about 9 km.

## **2.5. Training technical staff of Tam Dao NP**

One technical staff of Tam Dao NP and one forest ranger from Tam Dao FPU received training on Primate survey techniques and recording of species-specific information. Before the survey, the trainees were offered brief knowledge on status and conservation importance of Francois langur and other primates; the approaches to conserve these globally threatened species and survey methods to be used (village interview, transect survey, identification of Francois langur and signs of its activities in the field, use of survey equipment, data analysis, etc.). Latter on, the trainees participated directly on survey activities for on-job training.

### III. RESULTS AND DISCUSSION

#### 3.1. Interview information about francois langur and other primates

As mentioned above, about 90 people from 11 villages and 4 forest guard stations have been interviewed. However, only 16 persons could provide some information about primates in the Park during recent 10 years. As reported by the interviewees, before 1980, Francois langur was common in Tam Dao NP. They could be found in many areas of the Park. However, extensive hunting has eliminated Francois langur from most of the Park's territory. At present, very small population of this species may occur in area ranging from Ao Dua (0563000;2378200) to Rung Rinh peak (0565300; 2575100):

- A number of Interviewees from Xom Vang village (Quan Chu Commune) reported sighting a group of 3 langurs in March 2005, at Thien Thi peak and few langurs could survive in Ao Dua – Rung Rinh area today.
- Other interviewees from Chiem, Hoa Binh villages and Quan Chu townlet of Quan Chu communes reported low possibility of Francois langur existence in Tam Dao NP and Ao Dua - Rung Rinh area was of its highest existence probability. Four (4) species of Macaques (Rhesus macaque, Stump-tailed macaques, Pig-tailed macaque, Assamese macaque) and Slow loris were occasionally seen in the area.
- Interviewees from Cat Ne commune provided the same information as interviewees from Quan Chu Commune, except one interviewee who reported to see a group of Francois langur of 5-10 individuals (he saw 2 adults and one yellow infant) in October 2005, at Thach Ban Mountain slope. This man is a current hunter; when we came to his house, he was operating a fresh-killed leopard cat, and in his house we saw a fresh skin of another leopard cat and some frost squirrel bodies in his refrigerator.
- Interviewees from Tam Dao Town informed their sighting a group of 4-5 francois langurs, 4-5 years ago, at Thien Thi-Thach Ban slope. Few individuals of this species might survive in the area today. Other macaque species and Slow loris were still occasionally observed or hunted in the forest.
- Interviewees from Hop Hoa, Dao Tru, Dai Dinh, Tam Quan communes and from 5 Forest guard station reported no information about francois langur obtained during recent 10 years.

So, interview information reports possible existence of few individuals of Francois langur in Ao Dua – Rung Rinh area of Tam Dao NP. This area was taken for extensive field investigation.

#### 3.2. Field investigation information about Francois langur and other primates

As mentioned above, the survey effort consists of 12 days for active field investigation; 14 transects with total of 139 km were made and 53 watching hours were conducted. However, very little information about Francois langur and also other primate species could be obtained (Table 2, Fig.2).

**Francois langur:** no direct sighting was obtained. There is only one dung pile possibly of Francois langur was found in 25 November 2006, at North Ao Dua area (0564064; 2377837; alt. 1275). The dung was on stone under tall forest. The dung consists of only

fine remains of leave. The form and content of the dung very resemble dung of leaf-eating langur (Fig. 3).

**Table 2: Field records of Francois langur and other primates in surveyed area**

No.	Species	Information	Locality	Coordinates
1.	<b>Francois langur</b> ( <i>Tr. francoisi</i> )	Fresh dung	North Ao Dua	0564064; 2377837 alt. 1275
2.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Nearly fresh and old dungs	North Ao Dua area	0564364; 2378331 Alt. 1255
3.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Nearly fresh dung	Ao Dua area	0564812; 2377244 Alt.1190
4.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Eaten fruits ( <i>Annona sp.</i> )	Ao Dua area	0564309; 2377650 Alt. 1213
5.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Old dung	Thien Thi slope	0566051; 2376030 alt.860
6.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Nearly fresh dung	Thach Ban slope	0565877; 2376231 alt. 1196.
7.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Nearly fresh dung	Thach Ban slope	0566016/ 2376803
8.	<b>Rhesus macaque</b> ( <i>Macaca mulatta</i> )	Sighting a group of about 5-10 individuals	Thach Ban slope	0565895; 2376685 Alt. 1196
9.	<b>Macaque</b> ( <i>Macaca sp.</i> )	Eaten fruits ( <i>Lithocarpus sp.</i> ) and bamboo shoot	Thien Thi slope	0565791;2376091 alt.1172.
10	<b>Macaque</b> ( <i>Macaca sp.</i> )	Fresh dung	Thien Thi slope	0566039; 2376028 alt.1090
11.	<b>Stump-tailed macaque</b> ( <i>Macaca arctoides</i> )	sighting a group of about 5 -10 individuals	Thien Thi – Rung Rinh pass	0565410; 2375816 alt. 1339.

**Rhesus macaque:** One direct sighting of a group of about 5 -10 individuals was obtained at 9:40 am, 19 November 2006, near the top of Thach Ban Mountain (0565895; 2376685; alt. 1196). The weather was fine sunny. The animals were feeding on forest canopy, making some noise. We tried to approach the animals to have a good view, however, they soon noted us and moved away down to slope.

**Stump-tailed macaque:** One direct sighting of a group of about 5-10 individuals was obtained at 9:50 am, 16 November 2006, in pass between Thien Thi and Rung Rinh Peak (0565410; 2375816; alt. 1339). The macaques were feeding both on trees and on the ground, rolling stones down the slope. As we approaching the animals moved down the slope. Many fresh eating signs of fruits and young bamboo shoots and over-turned rocks remained in the site.

**Other macaques:** no direct sighting was obtained for other macaques. A number of macaque dung and eating signs were found in Thien Thi, Thach Ban slopes and Ao Dua area (Table 2, Fig.4 to Fig.8) but impossibility to identify which macaque species the dung belong to.

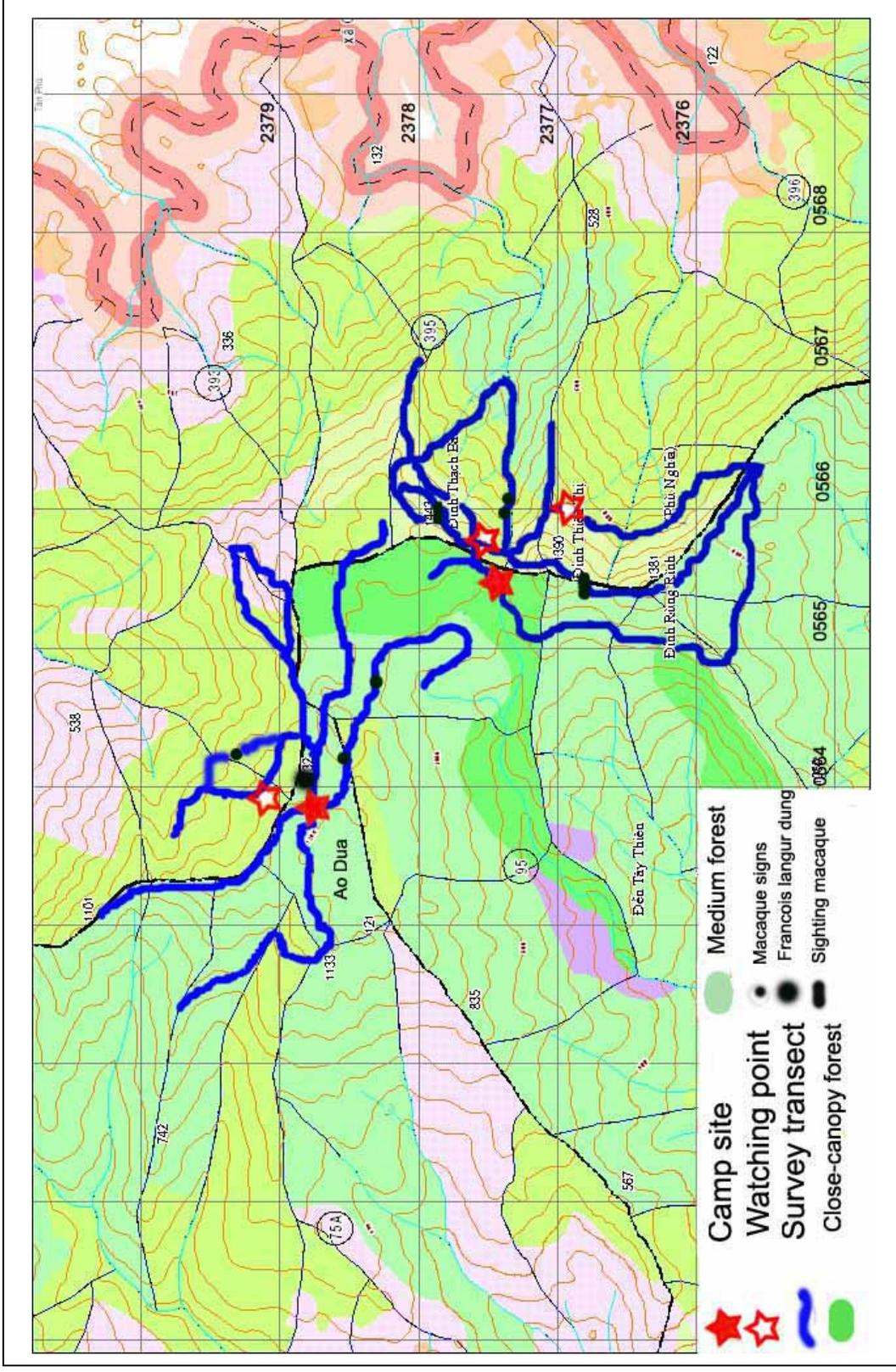


Figure 2: Localities of Primate records in surveyed area

## Discussion:

Tam Dao NP once had rich primate fauna. At least, 8 primate species have been recorded in the Park in previous studies (Do Tien Long 1992, FIPI 1993 and Cao Van Sung et al. 1998) (Table 3).

**Table 3. Primate species recorded in Tam Dao NP and their conservation status**

No.	Scientific name	English name	Year of records*				VRDB 2000	IUCN 2006
			1992	1993	1998	2005		
1.	<i>Nycticebus bengalensis</i>	Slow Loris	Sp.	O.	O.	Sn.	V	VU
2.	<i>Macaca arctoides</i>	Stump-Tailed Macaque	Sp.	Sp.	Re.	Re.	V	VU
3.	<i>Macaca mulatta</i>	Rhesus Macaque		Re.	Re.	Re.		LRnt
4.	<i>Macaca assamensis</i>	Assamese Macaque	Sp.	Re.	Re.	Re.	V	VU
5.	<i>Macaca nemestrina</i>	Pig-tailed Macaque	Re.	Re.	Re.	Re.	V	VU
6.	<i>Trachypithecus francoisi</i>	Francoi's Langur	Sp.	O.	Re.	Re.	V	VU
7.	<i>Rhinopithecus avunculus</i>	Tokin Snub-nosed Monkey	Re.	O.		Ext.	E	CR
8.	<i>Nomascus concolor</i>	Black Crested Gibbon	Ext.	Ext.	Re.	Ext.	E	EN

*Note: (\*) – records for 1992 by Do Tien Long (1992), for 1993 and FIPI (1993), for 1998 by Cao Van Sung et al. (1998) and for 2005 by Nguyen Xuan Dang et al. (2005).*

*O- observation; Sp- specimen, Sn – sign, Re – reported. Ext- extinction. VRDB – Red Data Book of Vietnam (2000): E – endangered, V- vulnerable. IUCN- 2006 IUCN Red List: CR- Critical, EN- endangered, VU- Vulnerable, LRnt- Low Risk/near threatened*

However, the Park always faces with very high hunting and habitat destruction pressure from local human communities (Do Tien Long, 1992, FIPI, 1993, Cao Van Sung et al., 1998, Tordoff et al, 2004) and late establishment of the Park's Management Board in 1996 could not prevent the primate fauna from rapid degradation. Survey of Nguyen Xuan Dang and his collaborators in 2004-2005 found 2 species (Black Crested Gibbon *Nomascus concolor*, Tonkin Snub-nosed Monkey *Rhinopithecus avunculus*) being extirpated from the Park and other 6 species remaining in very low number (Nguyen Xuan Dang et al. 2005).

Francois langur, as reported by most of our local interviewees was very common in the Park before 1980. The langur was regularly hunted animals of local hunters in many villages around the Park. In 1992-1993, the francois langur population was estimated of only 40-120 individuals (Do Tien Long, 1992) and FIPI, 1993). In 1998, Cao Van Sung et al. (1998) conducted re-assessment of the Park' fauna and noted very low number of the langur population while hunting pressure remained very high. Nguyen Xuan Dang et al. (2005) could not obtain any direct sighting of Francois langur during their surveys in 2004 and 2005, however, their interview information reports existence of a small group

of Francois langur in Thien Thi – Thach Ban area. This our specific primate survey in November 2006, again could not get any direct sighting of the Francois langur in the Park, only a single possible dung pile found in North Ao Dua area is not enough to confirm the existence of species. So, Francois langur very likely have been extirpated from Tam Dao NP or remains only in very few individuals (possibly, less than 10 individuals, based on interview information).

The existence of Rhesus macaque and stump-tailed macaques was confirmed in this survey by direct sighting, however, very low sighting rate (1 sightings per 12 days of active search in 14 transects with total of 139 km and 53 hours of point watching) and small number of animals in each sighted groups (less than 10 individuals) indicate their very low number remained. Existence of Pig-tailed macaque and Assamese macaque in Tam Dao NP could not be confirmed and their number is obviously very low if some remain.

### **3.3. Threats to Primate fauna**

Tam Dao NP has two main forest types, lowland evergreen forest and lower montane evergreen forest with some elfin forest on high peaks (Tordoff, 2002). At present, though having been over-exploited for many years, Tam Dao NP still support one of the most extensive, contiguous tracts of lowland, lower montane and bamboo forests in Northern Vietnam. Good tall forests which can provide primates with rich food source and good refuge still occur in large areas of Park including Suoi Tram-Suoi Tien up-stream (Khang Nhat and La Bang Communes); Tam Dao North area, Tay Thien- Ao Dua - Rung Rinh area and Xa Huong up-stream. Main current threats to primate fauna as well as other wildlife species are wildlife hunting, trapping and habitat disturbance.

*Wildlife hunting and trapping:* this is the most serious direct threat to primate fauna in Tam Dao NP. As high economic animals, all primate species are main hunting target of local hunters. The primate are hunted by guns and traps. The hunted animals are used both for local consumption as meat or medicine preparation and for trade to big cities. During field survey, we did not meet any hunters in forests but some places with signs of hunters overnight (cooking, sleeping mates, etc.) were found in Ao Dua area and Thien Thi slope. Traps and also trapped pheasant are also found in surveyed area (Fig.9). Especially, during our village interview we found that local people from many villages around the Park still go hunting. On 13 November 2006, at Cat Ne commune (Thai Nguyen Province) we saw one hunter operating fresh hunted leopard cats (Fig.10). In his house we also found another skin of leopard cats and some frost bodies of squirrels in refrigerator. He informed that in April 2006 he met a group of about 7 stump-tailed macaques in Thach Ban Mountain, killed 2 of them and caught one infant. The infant was dead after some months of keening in his house, the hunted macaques he used to make macaque balm. He showed us 2 pieces of the balm and asked for 200,000 VND per 100g. High wildlife hunting pressure is also documented in our previous studies (Nguyen Xuan Dang et al., 2005, Nguyen Xuan Dang et al., 2006).

*Habitat disturbance:* as mentioned above, the forests in Tam Dao NP can still provide Primates with good food sources and refuges, however, the forests are highly disturbed by various activities of local residents such as timber cutting, harvesting fuel-wood and other non-timber products (mushrooms, bamboo shoots, medicine plants, etc.). During our field survey we saw several fresh timber cutting sighs. On 19 November 2009, we saw a group of 7 men cutting timber in Thach Ban slope (0566821; 2376502) of Ky Phu

Commune (Fig. 11). The construction of new motor-road from Tam Dao Town upto the foot of Rung Ring mountain also causes great disturbance to the primate habitat (forest loss, noise of trucks and machines, human encroachment).

### 3.4. Records of other mammals

This is a specific primate survey, so all efforts were spent for recording information about the primate species. Nevertheless, we could get some records of other mammals (Table 4).

**Table 4: Records of other mammals during the survey**

English name	Scientific name	Information
Small-Toothed Ferret-Badger	<i>Melogale moschata</i>	Trapped animal
Southern Serow	<i>Naemorhedus sumatraensis</i>	Fresh dung, tracks
Leopard Cat	<i>Prionailurus bengalensis</i>	Hunted animals
Asiatic Brush-Tailed Porcupine	<i>Atherurus macrourus</i>	Trapped animal
Black Giant Squirrel	<i>Ratufa bicolor</i>	Observation
Pallas's Squirrel	<i>Callosciurus erythraeus</i>	Observation and trapped animal
Perny's Long-Nosed Squirrel	<i>Dremomys pernyi</i>	Observation
Red-Cheeked Squirrel	<i>Dremomys rufigenis</i>	Observation

### 3.5. Results of staff training

One technical staff of Tam Dao NP (Mr. Phan Tien Lam) and one forest ranger from Tam Dao FPU (Mr. Nguyen Duc Long) participated this survey as trainees. Mr. Phan Tien Long, 24 years old, graduated Vietnam Forestry University and works in Centre for Research and Technical Service of Tam Dao NP. Mr. Nguyen Duc Long, 44 years old, working as forest ranger in Tam Dao Forest Protection Unit. As Mr. Long knows the survey area very well so he also worked in survey as a field guide.

Before the survey, Dr. Nguyen Xuan Dang gave the trainees a brief knowledge about status and ecology of Francois langur and other primate species which occur in Tam Dao NP, the approaches to conserve this globally threatened species and techniques for their status assessment. Then, trainees participated in all survey activities to get on-job training.

Mr. Phan Tien Lam (Fig. 12), with good biological background, quickly obtained the conservation knowledge and survey techniques. He, now, can design the primate survey and conduct field search for direct sighting and indirect information of primates. However, he needs more training on identification of primate species from animal observation and their signs (tracks, dropping, sound, eating remains, etc.) to improve obtained information quality.

Mr. Nguyen Duc Long has no biological background, so it was more difficult for him to understand the nature of primate conservation approaches. However, as a local resident (born in Tam Dao Town), he learn some survey techniques very quickly, such as where to look for the primates feeding sites and sleeping sites, how to detect and identify primate signs, and designing survey transects in the survey area. However, some techniques such as point watching seems difficult for him. He could not stay watching for

several hours continuously. Mr. Long need more training on conservation knowledge and pittance-needed survey techniques.

#### **IV. RECOMMENDATION**

Primate fauna of Tam Dao NP is seriously degraded, however, the forests in the Park are still suitable to support relevant primate populations. The following measures are necessary to conserve the primate fauna of the Park:

- *Control of wildlife hunting, trapping, trading and forest disturbance*

The Park's Management Board should cooperate with local authorities, especially enforcement agencies (Forest Protection Unit, Market Customs, etc.) to control of wildlife hunting, trapping, trading and forest disturbance in Tam Dao NP. Forest rangers should conduct more regular patrols into primate areas to prevent any further killing of primates and their habitat degradation (timber cutting, non-timber forest product harvesting, etc). Timely and strict punishment should be applied to any violation detected. Awareness education needs to conduct in all buffer zone communes. Measures should be taken to stop wildlife keeping and wildlife dishes serving in local restaurants to reduce hunting pressure on the Park's populations.

- *Monitoring of primate populations in the Park*

Tam Dao NP should have regular primate monitoring programme to monitor status and living areas of primate populations to apply relevant conservation measures. The monitoring team may consists of 2-3 technical staff members which will conduct transect primate search in monthly basis to record information about primate status and their habitat disturbances. The monitoring team should submit Park's director with monthly report about their survey activities, their findings and management suggestions.

- *Re-introduction of confiscated primates into the Park*

All populations of primates in Tam Dao NP are too small to self-sustain in long time. Small populations are more vulnerable by many factors such as hunting, diseases, forest fires, genetic problems etc. The increase of individuals would better to achieve by increase of natural birth rate of the populations, however, it may be very difficult or impossible for current conditions in Tam Dao NP. The other way to increase the primate population size is to re-introduce individuals from other sources, such as confiscated individuals from illegal hunting and trade. However, before any release into the Park, the confiscated primates should pass through thorough health check and species identification and to ensure release of healthy animals and right species which has distribution in the Tam Dao NP. After-release monitoring is also necessary to ensure survival of released animals in the Park and not any negative impacts on native primate populations of the Park.

**ILLUSTRATION PICTURES**



**Figure 3: Dung possibly of Francois langur found in North Ao Dua area.**



**Figure 4: Macaque dung found in North Ao Dua area**



**Figure 5: Macaque dung found in Thien Thi slope**



**Figure 6: Remains of fruits eaten by macaque found in Thien Thi slope**



**Figure 7: Bamboo shoot eaten by macaque found in Thien Thi slope**



**Figure 8: *Annona* fruits eaten by macaque found in Ao Dua area**



**Figure 9: Trapped pheasant found in North Ao Dua area**



**Figure 10: Hunted leopard cat found in Hunter's House (Cat Ne Commune)**



**Figure 11: Illegal timber cutting found in Thien Thi mountain (Ky Phu commune)**



**Figure 12: Mr. Phan Tien Lam (Trainee) doing point watching method**

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