

gtz

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# **CONTROL OF WILD ANIMALS IN CAPTIVITY AND ORCHID GARDENS IN TAM DAO NATIONAL PARK AREA**

With  
**GTZ OFFICE IN VIETNAM**  
Hanoi, Vietnam

And

**FOREST PROTECTION DEPARTMENT (FPD)**  
**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT (MARD)**  
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## Executive summary

Survey for maintaining wild animals in captivity and orchid gardens was conducted in Tam Dao Town and districts located in buffer zone of Tam Dao National Park. During this survey, 23 households/ facilities maintaining wild animals in captivity and 15 households/facilities keeping orchid gardens have been inventoried. The largest collection of captive animals is minizoo “Cong Vien Ca Sau” in Nui Coc Tourism Site and the largest collection of orchids are “Primary Orchid Pallas” and “Orchid Station” in Tam Dao Town.

Totally, 38 species of wild animals in captivity was recorded including 11 species of mammals, 20 species of birds and 7 species of Reptiles. Majority of them were caught from Tam Dao area. Out of 38 species recorded, 18 species are of high conservation priority, including 8 nationally threatened species, 8 globally threatened species and 16 species enlisted in Governmental Decree 48/2002/NDCP.

Fifty four (54) species of orchids are recorded in orchid gardens. Out of them, 28 species have provenance from Tam Dao NP, 25 species are bought from other localities. Eleven (11) species of Genus *Paphiopedilum* are listed in Governmental Decree 48/2002/NDCP as IA category (strict ban of exploitation and use); 6 species are nationally threatened and 22 species are globally threatened.

Keeping and sale of wildlife and orchids is not a livelihood issue and is mostly carried out commercially, illegally and in small scale. Closing down the commercial facilities (especially the wildlife traders) will not impact on poor people.

Market demand for wild animals and orchids is high and increasing with increase of tourism flow to Tam Dao area, causing threat to increase of maintaining wild animals and orchids in captivity in future.

Awareness of owners of captive wild animals and orchid gardens on national legislation of biodiversity conservation is low and local forest protection force have not yet applied strict measures to control of wild animal maintaining and orchid garden growing.

Major proposed measures for control of illegal maintaining wild animals and orchid gardens are:

- Bear keeping: Provincial Forest Protection Departments should conduct inventory of all bear-keeping households, marking all bears and initiate regularly checking system. Request all bear owners to sign commitment of not increase of their captive bears, while improvement of bear husbandry conditions. It is possible to allow bear owner to conduct gall extraction in limited amount, probably twice year and 50 cubic mm per extraction time to cover cost of bear husbandry.
- Other animals: Local forest protection units should conduct inventory of all wildlife-keeping households in the area. Request commercial keeping households/agencies register their business with local authority and local Forest Protection Department for keeping non-wild caught animals. All individuals of wild caught provenance and threatened species should be confiscated and send to Soc Son Rescue Centre for further quarantining and health care process. Other species can remain in property of the owners for further husbandry. These households should sign commitment of not selling, not increase of the collection from wild stock. Keeping of threatened species or species listed in IB category of Decree 48/2002/NDCP should strictly forbidden.

- Forest Protection Unit of Tam Dao NP should collaborate with Forest Protection Units of Tam Dao and Dai Tu District and Nui Coc Forest Protection Units to conduct official inventory of all orchid gardens occurred in the area. Establish system of monitoring orchid growing in the area. There maybe 2 possible solutions for wild orchids grewed illegally in the orchid gardens: 1) Request owners continue to keep these orchids without sale or transferring into other places, or, 2) Confiscate all and transfer to research or rescue facilities for artificial propagation study, such as “Orchid Station” of Institute of Agriculture Genetics or to be established rescue station of Tam Dao NP
- Require all orchid-keeping households register to local authority and local Forest Protection Department and sign commitment of not growing wild harvested orchids and having relevant facilities for orchid maintaining in good status.
- Artificial propagation from nursery stock could supply local people with a legitimate income source. It needs to have some facilities to provide artificial nursery stock to these households. A MOA might be developed with GOV facilities to supply shoots for local people interested in growing orchids under a monitored association. Establishment of “Tam Dao Orchid Association” to monitor orchid growing and promote orchid conservation activities.

# 1. INTRODUCTION

Tam Dao National Park (TDNP) represents as famous tourism site in Vietnam. The demand for products from wild animals (for food, traditional medicine and for pet) and plants (especially orchids) is increasing. In order to provide supply for this demand, many households in TDNP area keep wild animals and maintain orchid gardens (Nguyen Quang Truong *et al.*, 2004). The animals are illegally captured and orchids are illegally collected from TDNP or its surrounding areas, which causes detrimental effects to biodiversity conservation in TDNP.

Vietnam legislation has promulgated strict regulations on protection of wild animals and plants:

- Strict prohibition of any actions of forest destruction, forest fire; encroachment of forests and lands for forest planting; exploitation, trade of forest products, hunting forest animals, raising domestic cattle in forests which are not according the law regulation. (Article 20 of Forest Protection and Development Law).
- Government Decree 18/HDBT, dated 17 January 1992 of Council of Ministers (now Government) and Decree 48/2002/ND-CP, dated 22 April 2002 of Government have promulgated a list of precious and rare wild plants and animals and regulation for its management and protection. According to these decisions, Government strictly prohibits exploitation and use of precious and rare wild plants and animals of Group I; limits exploitation and use of precious and rare wild plants and animals of Group II (Article 3); Exploitation of wild animals of group II can be only for cases of high necessity such as for propagation, scientific study, international breeding exchange and others, with permission of Ministry of Forestry (now MARD) (Article 8c).
- Government encourages, supports and ensure interests of organizations and individuals to protect, develop resources of precious and rare wild plants and animals (Article 4, Decree 18/HDBT).
- Government encourage organizations and individuals to breed wild animals, including precious, rare wild animals for commercial purpose and export in accordance with regulations stipulated in Decree 18/HDBT, dated 17 January 1992 and other current legislations, CITES. (Instruction No. 359-TTg, dated 29 May 1996 of Prime Minister on urgent measures for protection and development of wild animals).

Government Decision No.11/2002/ND-CP, dated 22 January 2002 of Government on control of import, export and transit of wild plant and animal species also says, that the facilities for breeding or propagation of plant and animal species, enlisted in CITES Appendix I have to register with Management authority of Vietnam CITES (Article 6); the facilities for breeding or propagation of plant and animal species, enlisted in CITES Appendix II have to register with local provincial Forest Protection Department which are invested with authority by Management authority of Vietnam CITES (Article 7).

The aim of project is to help TDNP and local FPD effectively to control illegally wildlife keeping and orchid gardens growing in TDNP area. Specific objectives of the project are:

1. Inventory all households keeping wild animals in captivity and maintaining commercial orchid gardens.
2. Identify the species and numbers of animals and orchids maintained, with a particular view to identifying dealers in rare species.

3. Identify the source/provenance of the animals and orchids (are they sourced from TDNP or other areas, are orchids propagated in the facility or are all specimens removed from the wild, etc.).
4. Identify the purpose of maintaining the animal and orchid facilities (which are commercial outlets).
5. Estimate the turnover of animals and orchids and their economic value to the households. Does the household have economic alternatives?
6. Estimate market demand for the species of animals and orchids traded (particularly for valuable species such as endemic or rare orchids). Is the supply and sale of animals and orchids opportunistic or contracted in advance by dealers from elsewhere?
7. Determine through structured interviews the awareness of the holders of animals and orchids concerning governmental conservation legislation.
8. Development of management measures to effectively control illegally maintaining wild animals in captivity and growing orchid gardens in Tam Dao NP area.

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## **2. METHODS OF STUDY**

Field survey in Tam Dao NP area was conducted from 11 to 18 October 2004, covering following sites:

- Lap Thanh District of Vinh Phuc Province: Dao tru Commune
- Tam Dao District of Vinh Phuc Province: Tao Dao Town; Ho Son, Dai Dinh and Tam Quan Communes and Tay Thien Tourism site.
- Son Duong District of Tuyen Quang Province: Son Duong Town and Son Nam Commune
- Dai Tu District of Thai Nguyen Province: Dai Tu Town, Nui Coc Tourism Site and Yen Lang Commune

In each localities, survey team firstly conducted interviews with local residents to detect households which maintain wild animals in captivity or orchid gardens, then visited these households to take necessary records ( species identification, number of individuals, their provenance, purposes of keeping/growing, etc.). Local forest protection units were asked to involve only in the cases which maintain large number of animals or orchids and request official introduction of Forest Protection Unit for inventory.

In order to develop viable control measures the survey team have consulted with following Forest Protection Department (FPD) and Forest Protection Units (FPU): Thai Nguyen FPD, Dai Tu FPU, Nui Coc FPU, Tuyen Quang PFD, Son Duong FPU, Vinh Phuc FPD, Tam Dao PFU and FPU of Tam Dao National Park. The list of consulting persons is provided in annex 1.

## **2 RESULTS**

### **3.1. INVENTORY OF HOUSEHOLDS MAINTAINING WILD ANIMALS IN CAPTIVITY**

- **Tam Dao Town**

In Tam Dao Town, there is no households or facilities which maintain wild animals in captivity for commercial purpose. There are only some households which keep 1-2 individuals of birds (*Acridotheres sp.* or *Garrulax sp.* ) for pet only.

- **Tay Thien Tourism site and Son Nam, Dao Tru, Dai Dinh, Tam Quan Communes**

There are 7 households maintaining wild animals in captivity, of which 3 households keeping birds for pet, 1 household keeping tree squirrel for pet and 3 households keeping birds for sale, namely, Mr. Do Van Thong at Son Nam Commune, Mr. Ton Van Thanh at Dao Tru Commune and Mr. Nang Xuan Khanh at Tam Quan Commune (Table 1).

**Table 1: Households maintaining wild animals in Tay Thien and 4 adjacent communes**

Households	Species and number of individuals	Purpose of maintaining
<b>Mr. Do Van Thong</b> Bam Village, Son Nam Commune, Son Duong District, Tuyen Quang Province	Black-throated laughing thrush <i>Garrulax chinensis</i> (3), Great Mynah <i>Acridotheres grandis</i> (3), Chinese Jungle Mynah <i>Acridotheres cristatellus</i> (1), Melodious Laughing Thrush <i>Garrulax canorus</i> (2), Bulbul <i>Picnonotus sp.</i> (2), Spotted-necked Dove <i>Streptopelia chinensis</i> (1), Red-collared Dove <i>Streptopelia tranquebarica</i> (2), Black-breasted leaf turtle <i>Geoemyda spengleri</i> (1).	For sale
<b>Mr. Ton Van Thanh</b> Phan Lan Village, Dao Tru Commune, Tam Dao District, Vinh Phuc Province.	Brush-tailed porcupine <i>Atherurus macrourus</i> (1), Chinese Cobra <i>Naja naja</i> (4), Common Rat Snake <i>Ptyas mucosus</i> (19), Magpie Robin <i>Capsychus saularis</i> (1), Laughing Thrush <i>Garrulax sp.</i> (2), Spotted-necked Dove <i>Streptopelia chinensis</i> (1).	For sale
<b>Mr. Le Van Long</b> Tam Quan Commune, Tam Dao District, Vinh Phuc Province.	Southern Grackle <i>Gracula religiosa</i> (1), Moustached Parakeet <i>Psittacula alexandri</i> (1), Black-throated laughing Thrush <i>Garrulax chinensis</i> (1).	For pet
<b>Mr. Nang Xuan Khang</b> Tam Quan Commune, Tam Dao District, Vinh Phuc Province	Black-collared Starling <i>Sturnus nigricollis</i> (1), White-crested Laughing Thrush <i>Garrulax leucolophus</i> (3), Melodious Laughing Thrush <i>Garrulax canorus</i> (1), Spotted-necked Dove <i>Streptopelia chinensis</i> (47).	For sale
<b>Mr. Diep Anh Nguyet</b> Dai Dinh Commune, Tam Dao District, Vinh Phuc Province	Pallas's squirrel <i>Callosciurus erythraeus</i> (2)	For pet
<b>2 households</b> Tay thien area	Birds (1-3)	For pet and for sale occasionally

**Mr. Do Van Thong Household:** maintains 8 species (15 individuals), of which 7 bird species (14 individuals and one species of turtle (1 individual). The animals were caught from Tam Dao area. Keeping facility: Birds are kept in small cages. During day time the cages are hanging on tree

branches in front of his house to draw attention of tourists; in the evening the cage are removing into the house. The turtle is keeping in a small vessel with little water which is placed inside the house.

**Mr. Ton Van Thanh Household:** maintains 6 species (28 individuals), including 1 mammal species (1 individuals), 3 bird species (4 individuals) and 2 snake species (23 individuals). The animals were caught in Tam Dao area. Some snakes are from captive resources in other districts. Keeping facility: mammal (Brush-Tailed Porcupine) is kept in about 30 square metre ground surrounded by tall wall. The birds are kept in small bamboo or metal cages hanging under house roof. The cages are so small (about 20cm in diameter) that the birds can not have flight movement. The snakes are maintained in wooden cages inside the house together with people. Before, this household bred large number of snakes for sale, however, due to lack of natural food source and manpower for husbandry the household reduces number of captive snakes down to 20-30 individuals only.

There is a small bird colony (mostly egrets and herons) in private garden of Mr. Ton Van Thanh. The birds come here for overnight and nesting. The number of the birds may reach several thousand individuals. Mr. Thanh protects the colony from disturbance by other villages but his family often catch the birds (including newborn) for food and for sale. Tam Dao NP has not applied any serious measures to protect this bird colony.

**Mr. Nang Xuan Khang Household:** maintains 4 bird species (52 individuals). The birds are kept in small cages made of bamboo or metal net. The cages are too small for birds to have flight movement. During day time the cages are hanging under trees in front of his house and evening removing into the house. Mr. Nang Xuan Khang has successfully bred the Spotted-necked Dove-*Streptopelia chinensis* for sale already for many years. During our visit, 47 individuals born in captivity remain, other have been sold. The breeding pairs of Doves are kept in larger cages which are permanently placed in house side. Mr. Khanh informed that he has also successfully bred Pallas's squirrel – *Callosciurus erythraeus* and now prepared cages for captive breeding of some tree squirrels for sale. Mr. Khang and his wife are pensioners and income from commercial rearing of birds (about 1,000,000 VND/month) is significant for his family.

- **Nui Coc Tourism Site**

There is only one shop keeping bird (Black-throated laughing thrush *Garrulax chinensis*) for pet and a minizoo “Cong Vien Ca Sau” (Crocodile Park) of Stock Company of Nui Coc Tourism Trade-Union keeping relatively large number of animals for tourists visiting (Table 2).

**Cong Vien Ca Sau (Crocodile Park):** maintains 20 species of wild animals and some other species of non-wild caught species (Crocodile, Sika deer, etc.). Out of 20 species of wild animals, 5 species of mammals (8 individuals), 13 species of birds (22 individuals) and 2 reptile species (6 individuals). In general, the keeping cages and enclosures are still simple and small (except cage for macaque) without enough space for normal movement of the animals. There is 6 persons responsible for the animal maintaining, of them only 2 persons received short training on husbandry techniques at Thuy Phuong Poultry Research Centre. There is even no veterinary doctor. Due to poor husbandry conditions the animals often died after some months of stay in the zoo and the zoo has to buy other wild animals from hunters to replace.

The leaders of this company informed that they had permit for running the zoo, however, local Forest protection agency have not seen the permit though requested for several times. At present, the local forest protection agencies have not taken necessary measures to control of purchasing wild animals by the company.

**Table 2: Company keeping wild animals in captivity in Nui Coc Tourism Site**

Company	Species and number	Purpose of maintaining
<p><b>Cong Vien Ca Sau</b> (Crocodile Park)</p> <p>Stock Company of Nui Coc Tourism Trade-Union</p>	<p>Black bear-<i>Ursus thibetanus</i> (2), Leopard cat – <i>Prionailurus bengalensis</i> (1), Assamese macaque – <i>Macaca assamensis</i> (1), Stump-tailed macaque – <i>Macaca arctoides</i> (1), Pallas squirrel – <i>Callosciurus erythraeus</i> (3), Bulbul – <i>Picnonotus sp.</i> (2), Melodious Laughing Thrush – <i>Garrulax canorus</i> (2), Black-throated laughing thrush – <i>Garrulax chinensis</i> (1), White-crested laughing thrush – <i>Garrulax leucolophus</i> (1), Mustached Parakeet – <i>Psittacula alexandri</i> (2), Black-collared Starling – <i>Psittacula alexandri</i> (1), Daurin Starling – <i>Sturnus sturnicus</i> (1), Siberian Rubythroagh – <i>Erithacus calliope</i> (2), Common Crow-pheasant – <i>Centropus sinensis</i> (1), Silver pheasant – <i>Lophura nycthemera</i> (1), Spotted-necked Dove-<i>Streptopelia chinensis</i> (2), Chinese Pond Heron – <i>Ardeola bacchus</i> (3), Red Jungle Fowl- <i>Gallus gallus</i> (2), Black-breasted leaf turtle – <i>Geoemyda grandis</i> (5), Stripe-necked leaf urtle-<i>Cyclemys tcheponensis</i> (1).</p>	<p>Black bear: for gall extraction and for exhibition</p> <p>Other species: for tourists visit</p>

- **Dai Tu Town and Yen Lang Commune**

There is one household (Mr. Trieu Van Hong) maintaining wild animals for commercial purpose and about 10 other households keeping 4 bird species for pet with small number (1-6 individuals each). In Yen Lang Commune there are 3 households keeping wild animals for commercial purposes (Table 3).

**Table 3: Households maintaining wild animals in Dai Tu Town and Yen Lang Commune**

Household	Species and number	Purpose of maintaining
<p><b>Mr. Trieu Van Hong</b> Dai Tu Town, Thai Nguyen Province</p>	<p>Black Bear- <i>Ursus thibetanus</i> (6), Sambar – <i>Cervus unicolor</i> (2), Sika deer – <i>Cervus nippon</i> (6), Crested porcupine- <i>Acanthion subcristatum</i> (4), Common palm civet – <i>Paradoxurus hermaphroditus</i> (1), Silver Pheasant- <i>Lophura nycthemera</i> : (5), Chinese soft shell turtle-<i>Pelodiscus sinensis</i> (ca.100)</p>	<p>For sale</p>
<p><b>Mr. Dang Hoi Sinh</b> Yen Lang Commune, Dai Tu District, Thai Nguyen</p>	<p>Black Bear- <i>Ursus thibetanus</i> (2), Porcupine- <i>Acanthion subcristatum</i> (2), Spotted-necked Dove- <i>Streptopelia chinensis</i> (8), Southern Grackle- <i>Gracula religiosa</i> (2), Black-throated laughing Thrush – <i>Garrulax chinensis</i> (1)</p>	<p>For sale</p>

<b>Mrs. Ngo Quang Nu</b> Yen Lang Commune Dai Tu District, Thai Nguyen Province.	Malayan Sun Bear- <i>Ursus malayanus</i> (1)	Fore sale of gall
<b>Mr. Trieu Van Long</b> Yen Lang Commune Dai Tu District, Thai Nguyen Province	Muntjak- <i>Muntiacus muntjak</i> (2), Red Jungle Fowl- <i>Gallus gallus</i> (2), Sika deer- <i>Cervus nippon</i> (4)	For pet, may be for sale in future
<b>Some households</b> Dai Tu Town	Birds ( <i>Sturnus nigricollis</i> , <i>Garrulax chinensis</i> , <i>Psittacula alexandri</i> , <i>Garrulax canorus</i> ).	For pet

**Mr. Trieu Van Hong Household:** maintains 7 species of wild animals, including 3 species of mammals (11 individuals), 3 species of birds (6 individuals) and 1 species of reptile (1 individual). Besides, this household also maintain 6 sika deers, 2 zambar and about 100 turtles of captive born sources. The bears are kept for gall extraction for sale, Sika deers and Sambar are for young antlers cutting for sale and breeding young for sale. Other animals are also kept for sale. Husbandry facilities are poor and placed just behind the house causing bad sanitary status both for people and animals. The cages are too small for bear to have their norman movement. Keeper is without proper training on techniques of animal husbandry.

**Mrs. Ngo Quang Nu Household:** maintains one Malayan sun bear (about 150kg weight) for gall extraction for sale. The bear is kept in small cage placed just behind the house. Gall extraction occurs once per 3 months.

**Mr. Dang Hoi Sinh Household:** Maintains 2 Black Bear, 3 porcupines (1 newborn), 10 Spotted-necked Doves, 1 Black –throated Laughing Thrush and 1 parakeet. The animals are kept just behind the house with very bad sanitary status. The keeping cages are very small for the animals.

**Mr. Trieu Van Long:** Maintains 2 muntjaks, 1 red Jungle Fowl and 4 Sika deers (captive-bred). Keeping enclosure is very close to house. Keeping facilities are very poor and owner has no training on wild animal husbandry techniques.

- **Son Duong Town area**

There is 2 households maintaining wild animals for commercial purposes. Some other households keep some species of bird for pet with small number of individuals (1-4 individuals). One household keeps snake for food (Table 4). All households have poor keeping facilities and have poor husbandry experience. Before, many households bred snakes for sale, however, now give up due to lack of source of natural food for snakes and they found other more profitable business (trade between Vietnam-Chinese borders).

**Table 4: Households maintaining wild animals in captivity in Son Duong Town.**

Households	Species and number	Purpose of maintaining
<b>Mrs. and Mr. Thu Quyet</b> Son Duong Town, Tuyen Quang Province	Black Bear- <i>Ursus thibetanus</i> (5)	For gall extraction for sale
<b>Mr. Nguyen Xuan Tao</b> Son Duong Town, Tuyen	Snakes (about 10)	For food

Quang Province		
<b>Mr. San</b> Son Duong Town, Tuyen Quang Province	Black-collared Starling – <i>Psittacula alexandri</i> (1), Magpie Robin- <i>Capsychus saularis</i> (3), Black-throated Laughing Thrush- <i>Garrulax chinensis</i> (2), Sooty Tree Babbler- <i>Stachyris herberti</i> (1), Spotted-necked Dove- <i>Streptopelia chinensis</i> (11), Red-whiskered Bulbul- <i>Picnonotus jocosus</i> (4), Chines Jungle Mynah – <i>Acridotheres cristatellus</i> (2).	For sale
<b>Some other households</b> Son Duong Town, Tuyen Quang Province	Birds (Black-throated Laughing Thrush- <i>Garrulax chinensis</i> , Red-whiskered Bulbul- <i>Picnonotus jocosus</i> , Chines Jungle Mynah – <i>Acridotheres cristatellus</i> , etc.) from 1-4 individuals	For pet

### 3.2. SPECIES LIST OF WILD ANIMALS IN CAPTIVITY

Totally, 38 species of wild animals in captivity was recorded including 11 species of mammals, 20 species of birds and 7 species of Reptiles (Table 5). However, it should note that this inventory was not on heat of tourism season. As reported by local people during the heat of tourism season, number of species and especially number of their individuals usually higher than during other time.

**Table 5: Species list of wild animals in captivity recorded in Tam Dao area**

No	English name & Vietnamese name	Scientific name	Number of Individ.	Provenance
	<b>I. Mammals</b>			
1.	Stump-tailed macaque (Khỉ mặt đỏ )	<i>Macaca arctoides</i>	1	Un-known
2.	Assamese macaque (Khỉ mốc)	<i>Macaca assamensis</i>	1	Un-known
3.	Black Bear (Gấu ngựa )	<i>Ursus thibetanus</i>	15	Laos, North Vietnam
4.	Malaysian Sun Bear (Gấu chó)	<i>Ursus malayanus</i>	1	North Vietnam
5.	Common Palm Civet (Cây vòi đốm )	<i>Paradoxurus hermaphroditus</i>	1	Within Dai Tu Forest
6.	Leopard Cat (Mèo rừng)	<i>Prionailurus bengalensis</i>	1	Forest of Nui Coc area
7.	Sambar (Nai)	<i>Cervus unicolor</i>	2	Un-known
8.	Muntjak (Hoẵng)	<i>Muntiacus muntjak</i>	1	Buffer zone of Tam Dao NP
9.	Pallas's squirrel (Sóc bụng đỏ )	<i>Callosciurus erythraeus</i>	5	Tam Dao NP and its vicinity
10.	Crested Porcupine (Nhím bờm)	<i>Acanthion subcristatum</i>	7	Buffer zone of Tam Dao NP
11.	Brush-tailed porcupine	<i>Atherurus macrourus</i>	1	Buffer zone of Tam

	(Hon)			Dao NP
	<b>II. Birds</b>			
12.	Chinese Pond Heron (Cò bọ)	<i>Ardeola bacchus</i>	3	Nui Coc Lake
13.	Red Jungle Fowl (Gà rừng)	<i>Gallus gallus</i>	2	Forests of Dai Tu District
14.	Silver Pheasant (Gà lôi trắng)	<i>Lophura nycthemera</i>	4	Forests of Dai Tu District
15.	Grey Peacock-Pheasant (Gà tiên mặt vàng)	<i>Polyplectron bicanaratum</i>	1	Un-known
16.	Spotted-necked Dove (Cu gáy)	<i>Streptopelia chinensis</i>	74	Buffer zone of Tam Dao NP
17.	Red-collared Dove (Cu ngói)	<i>Streptopelia tranquebarica</i>	2	Buffer zone of Tam Dao NP
18.	Moustached Parakeet (Vẹt ngực đỏ)	<i>Psittacula alexandri</i>	4	Buffer zone of Tam Dao NP
19.	Common Crow-pheasant (Bìm bịp lớn)	<i>Centropus sinensis</i>	1	Buffer zone of Tam Dao NP
20.	Red-whiskered Bulbul (Chào mào đít đỏ)	<i>Picnonotus jacorus</i>	10	Buffer zone of Tam Dao NP
21.	Bulbul (Chào mào)	<i>Picnonotus sp.</i>	1	Buffer zone of Tam Dao NP
22.	Magpie Robin (Chích choè)	<i>Capsychus saularis</i>	5	Buffer zone of Tam Dao NP
23.	Siberian Rubythroat (Oanh cổ đỏ)	<i>Erithacus calliope</i>	2	Buffer zone of Tam Dao NP
24.	Black-throated laughing Thrush (Khướu bạc má)	<i>Garrulax chinensis</i>	21	Buffer zone of Tam Dao NP
25.	Laughing Thrush (Khướu mun)	<i>Garrulax sp.</i>	2	Buffer zone of Tam Dao NP
26.	White-crested Laughing Thrush (Khướu đầu trắng)	<i>Garrulax leucolophus</i>	4	Buffer zone of Tam Dao NP
27.	Melodious Laughing Thrush (Hoạ mi)	<i>Garrulax canorus</i>	9	Buffer zone of Tam Dao NP
28.	Great Mynah (Sáo mỏ vàng)	<i>Acridotheres grandis</i>	3	Buffer zone of Tam Dao NP
29.	Chinese Jungle Mynah (Sáo mỏ ngà)	<i>Acridotheres cristatellus</i>	6	Buffer zone of Tam Dao NP
30.	Black-collared Starling (Sáo sậu)	<i>Sturnus nigricollis</i>	3	Buffer zone of Tam Dao NP
31.	Southern Grackle (Yểng)	<i>Gracula religiosa</i>	4	Buffer zone of Tam Dao NP
	<b>III. Reptiles</b>			
32.	Burmese Python (Trăn đất)	<i>Python molurus</i>	1	Buffer zone of Tam Dao NP
33.	Common Rat Snake (Rắn ráo trâu)	<i>Ptyas mucosus</i>	19	Buffer zone of Tam Dao NP and other areas
34.	Chinese Cobra (Rắn hổ mang)	<i>Naja naja</i>	4	Buffer zone of Tam Dao NP and other areas
35.	Giant land turtle	<i>Heosemys grandis</i>	5	Un-known

	(Rùa đất lớn)			
36.	Stripe-necked Leaf Turtle (Rùa đất sêpôn)	<i>Cyclemys tcheponensis</i>	1	Un-known
37.	Black-breasted leaf turtle (Rùa đất spengle)	<i>Geoemyda spengle</i>	1	Buffer zone of Tam Dao NP
38.	Chinese soft shell Turtle (Ba ba tròn)	<i>Pelodiscus sinensis</i>	6	Buffer zone of Tam Dao NP

Out of 38 species of wild animals in captivity recorded, 2 species of Bears have no provenance in Tam Dao NP, 2 species of macaques are bought from other area, the rest 34 species are from Tam Dao NP and its vicinity.

There are 18 species being threatened or enlisted in Governmental Decree 48/2002/NDCP (2002) for strict ban of exploitation and use or limitation and controlled exploitation and use (Table 6):

- 8 species nationally threatened
- 8 species globally threatened
- 16 species listed in Governmental Decree 48/2002/NDCP

Existence of 18 threatened species, especially 16 species, enlisted in Decree 48/2002/NDCP in the list of illegally maintained species indicates serious law violation of these holders and agencies.

**Table 6: Threatened species in captivity recorded in Tam Dao Area**

No	English name	Scientific name	RDVN, 2000	RL IUCN, 2003	48/2002/N DCP
1	Stump-tailed macaque	<i>Macaca arctoides</i>	V	VU	IIB
2	Assamese macaque	<i>Macaca assamensis</i>		LR/nt	IIB
3	Black Bear	<i>Ursus thibetanus</i>	E	VU	IB
4	Malaysian Sun Bear	<i>Ursus malayanus</i>	E	DD	IB
5	Leopard cat	<i>Prionailurus bengalensis</i>			IB
6	Silver Pheasant	<i>Lophura nycthemera</i>	T		IB
7	Burmese Peacock-Pheasant	<i>Polyplectron bicanaratum</i>			IB
8	Black-throated laughing Thrush	<i>Garrulax chinensis</i>			IIB
9	Laughing Thrush	<i>Garrulax sp.</i>			IIB
10	White-crested Laughing Thrush	<i>Garrulax leucolophus</i>			IIB
11	Melodious Laughing Thrush	<i>Garrulax canorus</i>			IIB
12	Southern Grackle	<i>Gracula religiosa</i>			IIB
13	Burmese python	<i>Python molurus</i>	V	LR/nt	IIB
14	Common Rat Snake	<i>Ptyas mucosus</i>	V		IB
15	Chinese cobra	<i>Naja naja</i>	T		IIB
16	Turtle	<i>Geoemyda grandis</i>	V	VU	IIB
17	Turtle	<i>Geoemyda spengle</i>		EN	
18	Chinese softshell Turtle	<i>Pelodiscus sinensis</i>		VU	

*Note: RLVN, 2000 – Red Data Book of Vietnam, 2000: E- Endangered, V- Vulnerable, T- Threatened.*

*RL IUCN, 2003: 2003 IUCN Red List of Threatened species, 2003: EN- Endangered, VU- Vulnerable, LRnt- Near Threatened.*

*48/2002/NDCP- Gov. Decree 48/2002/NDCP: IB-Strict ban of exploitation and use, IIB- Limited and controled exploitation and use. .*

### **3.3. OVERALL NOTES RELATED TO MAINTAINING WILD ANIMALS IN CAPTIVITY IN TAM DAO AREA**

- *Intensity of hunting, use and captive maintaining*

Wildlife hunting in Tam Dao NP and its buffer zone is still common. However, majority of hunted animals are used by local hunters for food, sold to local eating shops or to local wildlife traders which will transport the animals to big cities for sale. Number of species and individuals remains in this area for captive maintaining is not high. Highest number of individuals in captivity belongs to Spotted-necked Dove (74 individuals), then follows Black-throated laughing Thrush (21 individuals), Common Rat Snake (19 individuals), Black Bear (15 individuals) and Red-whiskered Bulbul (10 individuals). Other species have only some individuals. Number of households and companies maintaining wild animals in captivity is also not high, only about 30 households and one company (Crocodile Park). The size of all collections is also small. The notable ones are Cong Vien Ca Sau (Crocodile Park) which keeps 20 species of 35 individuals, including 2 Black Sun Bears; Mr. Trieu Van Hong Household in Dai Tu Town which keeps 7 species of 24 individuals, including 6 Black Sun Bears; Mr. & Mrs. Thu Quyet Household in Son Duong Town, maintating 5 Black Sun Bears. The reason of low number of captive species and individuals is probaly due to keepers have poor knowledge on wild animal husbandry, causing high death rate of captive animals. Other reason is warning and confiscation by local forest protection forces.

- *Purposes of captive maintaining*

There are two main purposes of maintaining wild animals in captivity, namely commercial and for pet. In many cases both purposes are compiled. Out of 23 inventoried households and company, 8 households and one company are for commercial purposes, including 5 households maintaining bears for gall extraction, 3 households maintaining birds for sale and one household keeping snakes for sale. Other households keep birds and some other animals (squirrels, turtles, etc.) in very small number (1-5 individuals) for pet or for drawing attention of tourists to their shops. These households may sell their pet animals occasionally but it is not main purpose of their keeping.

The majority of animals are in fact kept by animal traders as a business. The fact that they are kept quite openly in the traders' houses is unusual and demonstrates a lack of enforcement.

- *Income driven from commercial maintaining wild animals in captivity*

The highest income is probably from keeping bear for their gall extraction. Majority of bears maintained in this area has body weight of 150-200 kg. These households extract bear gall once per 3 to 6 months, average extracted amount from one bear is about 80 cubic mm. Current market price of one cubic mm of gall is about 80,000 VND. Estimated money received from selling gall of one bear is about 13-19 million VND per year not yet excluding expenses for bear food and care. This amount is considerably high in comparison with income from other business in these area. Maintaining birds and snakes does not considerable income for keepers due to low number of captive individuals.

- *Economic status of households maintaining wild animals in captivity.*

All bear-keeping households are rich or at least not poor in the area. They always have other business (such as restaurant running, tradition medicine selling, electric good shops, etc.) which bring more important portion of their household income. We do not have statistical data, however, our observation and interviewing with the owners support this statement . Income from commercial keeping of other species is also as supplementary income to their main household incomes.

- *Need of alternative income sources if ban of commercial keeping wild animal.*

All households maintaining wild animals in captivity for commercial purpose are rich or not poor in the area. Income from commercial keeping wild animals represents not main income source for these households. Their main incomes are from other business. Therefore, ban of commercial keeping wild animals will not cause significant reduction of their household income.

- *Market demand*

Our study indicates that market demand for bear gall is high (rising due to increasing urban affluence). Current price of one cubic mm of bear gall is reduced from 100,000-120,000 VND in years before 2000 to 70,000-80,000 VND per now. The reason is that number of captive bears considerably increased (more than 2,000 captive bear for gall in the country now) that leads to increase of gall selling in market. However, current price of 70,000-80,000 VND per cubic mm is still very high for most of rural households which still want to use bear gall.

Market demand for birds and other animals is high and increasing due to increase of number of Vietnamese tourists visiting Tam Dao area. However, commercial snake keeping is much reduced in this area due to lack of natural food for the snakes. (particularly, king cobras which are most in demand are fed with other snakes and snakes cannot be bred in captivity, except Chinese Cobra.) and people (Son Duong Town) have got other more profitable business such as trade through Vietnam- Chinese border.

- *Awareness of local people on biodiversity conservation legislation*

All bear keeping households know that their keeping bear is violation and the bears can be confiscated by law enforcement forces, however, they do not understand clearly what the law says and why the bear keeping is prohibited and they keep going their bear husbandry due to its very high profit outcome and lack of strict law enforcement.

Households maintaining small animals (birds, squirrels, snakes, etc.) have very limited knowledge about the governmental biodiversity conservation regulations and enforcement force also does pay much attention to control of small animal keeping. Therefore, the animals are often hanged openly in front of their houses, even very close to offices of local forest protection.

- *Awareness of local forest protection forces on wildlife conservation*

In general, all staff members of local forest protection agencies know that keeping wild animals is prohibited by laws, however, they do not know the law regulations in details, and its detrimental impacts on wildlife conservation in Tam Dao NP and its buffer zone. Consequently, most of them don't pay serious attention to this problem, except bear keeping. Local forest protection agencies have not applied serious measures to stop illegal keeping of wild animals in

the area. Local rangers also can not distinguish threatened species or species listed in Governmental Decree 48/2002/NDCP and do not know how to treat the violation cases.

### 3.4. INVENTORY OF HOUSEHOLDS MAINTAINING ORCHID GARDENS

Totally, 15 households and facilities maintaining orchid gardens have been inventoried in Tam Dao area. Two (2) largest growing facilities are “Cung De Nhat Phong Lan” (Primary Orchid Pallas) and “Trai Lan” (Orchid Station) of Institute of Agriculture Genetics. Both are located in Tam Dao Town. All household orchid collections are small and found mainly in Tam Dao Town (13 households) and Nui Coc Tourism Site (2 households). In other survey sites (Dai Tu Town, Yen Lang Commune, Son Duong Town, Tay Thien Tourism Site) there is no commercial orchid collections. There are only several household maintaining 1-5 orchid pots for personal use. A list and size of inventoried orchid gardens is shown in Table 7.

### 3.5. SPECIES LIST OF PROPAGATED ORCHIDS

Totally, 54 species of cultivated orchids were recorded in Tam Dao NP and Nui Coc Tourism Site (Table 8). Out of them, 28 species have provenance from Tam Dao NP, 25 species are bought from other localities such as Hanoi, Thai Nguyen Province, Sapa, Ha Tay Province, Da Lat City, etc.

Some have tissue propagation provenance or from overseas. In general, majority of orchids cultivated in Tam Dao area are taken from the wild. The only 2 largest facilities - “Cung De Nhat Phong Lan” (The Primary Orchid Pallas) and “Trai Lan” (“Orchid Station) – grow artificially propagated orchids, however, also purchase wild orchids for growing and sale. This indicate necessity of strict control of all orchid growing facilities including governmental ones.

The most commonly seen orchids in the gardens are Acam cung - *Acampe rigida*, Que lan huong- *Aerides odorata*, Lan say- *Arundina graminifolia*, Thuy tien- *Dendrobium thyrsiflorum*, Da bao- *Hygrochilus parishii*, Hoang thao det- *Dendrobium nobile*, Kim Diep- *Dendrobium fimbriatum*, Truc Den- *Dendrobium hancockii*, Kim Diep- *D. chrysanthum*, Lan bong- *Flickingeria ritaeana*, Hai Tam Dao- *Paphiopedilum grantrixianum*, Tuc Doan Trung Quoc- *Pholidota chinensis*, Hac Dinh- *Phaius mishmensis*, Tai trau- *Rhynchostylis gigantea* (Table 8).

Out of 54 species recorded in gardens, 11 species of Genus Lan hai- *Paphiopedilum* are listed as (IA) category in Governmental Decree 48/2002/NDCP for strict ban of exploitation and use (Table 8), and also 6 species enlisted in Red Data Book of Vietnam (1996), including Kim tuyen - *Anoectochilus setaceus*, Hoang thao det- *Dendrobium nobile*, Thuy tien - *Dendrobium amabile*, Bach hoa hong- *D. bellatulum*, Hai tao- *Paphiopedilum appletonianum* and Hai long tim - *P. hirsutissimum*.

Except detrimental impacts of orchid exploitation, Tam Dao NP also suffers mass exploitation of fern trees for orchid substrates. This activity causes further degradation of biodiversity of Tam Dao NP and its surrounding area, because the substrates are collected not only outside but also inside the Park.

**Table 8: A list of orchids growing in Tam Dao area**

No	Scientific name	Vietnamese name	RBVN, (ND 48)	IUCN, 2003	Provenance
1.	<i>Acampe rigida</i> ( Buch.- Ham. ex J.E.Smith) P.F. Hunt	Acam cúng		LR	Tam Dao NP
2.	<i>Aerides odorata</i> Lour.	Quế lan hương		VU	Tam Dao NP
3.	<i>Anoectochilus setaceus</i> Blume	Kim tuyến	R	EN	

4.	<i>Arundina graminifolia</i> ( D. Don) Hochr.	Lan sậy		LR	Tam Dao NP
5.	<i>Bulbophyllum ambrosia</i> ( Hance) Schlechter	Câu điệp hạnh nhân		LR	Tam Dao NP
6.	<i>Bulbophyllum macranthum</i> Lindl.	Câu điệp hoa to		DD	Tam Dao NP
7.	<i>Bulbophyllum stenobulbon</i> Par. & Reichenb.f.	Câu điệp củ mảnh		LR	Tam Dao NP
8.	<i>Calanthe clavata</i> Lindl.	Kiều lan đỉnh		LR	Tam Dao NP
9.	<i>Cleisostoma striatum</i> ( Reichenb.f.) Garay	Mật khẩu sọc		LR	Tam Dao NP
10.	<i>Coelogyne fimbriata</i> Lindl.	Thanh đạm rìa		LR	Tam Dao NP
11.	<i>Coelogyne</i> sp	Thanh đạm			Tam Dao NP
12.	<i>Cymbidium aloifolium</i> (L.) Sw.	Đoãn kiếm, lô hội		LR	Tam Dao NP, Artificial
13.	<i>Cymbidium lancifolium</i> Hook. f.	Lục lan		LR	Tam Dao NP, Artificial
14.	<i>Cymbidium sinense</i>	Địa lan Trung quốc			Wild, Artificial
15.	<i>Cymbidium</i> spp	.Địa lan			Artificial, Artificial
16.	<i>Dendrobium draconis</i> Reichenb.f	Nhất điểm hồng		EN	Tam Dao NP, Artificial
17.	<i>Dendrobium amabile</i> (Lour.) O'Brien.	Thủy tiên hương, Kiều tím	R		Wild, Artificial
18.	<i>Dendrobium bellatulum</i> Rolfe.	Bạch hoả hồng	R		Wild, Artificial
19.	<i>Dendrobium capillipes</i> Reichb.f.	Kim điệp nam			Wild, Artificial
20.	<i>Dendrobium chrysanthum</i> Lindl.	Phi điệp vàng, ngọc vạn vàng		LR	Tam Dao NP, Artificial
21.	<i>Dendrobium fimbriatum</i> Hook.	Kim điệp, Long nhân		LR	Tam Dao NP, Artificial
22.	<i>Dendrobium hancockii</i>	Trúc đen		VU	Tam Dao NP, Artificial
23.	<i>Dendrobium lindleyi</i> Steudel.	Vảy rồng			Tam Dao NP, Artificial
24.	<i>Dendrobium nobile</i> Lindl.	Hoàng thảo dẹt	R	LR	Tam Dao NP, Artificial
25.	<i>Dendrobium</i> spp.	Hoàng thảo			Wild, Artificial
26.	<i>Dendrobium thyrsiflorum</i> Reichenb. f.	Kiều vàng, Thủy tiên vàng		LR	Tam Dao NP, Artificial
27.	<i>Eria</i> sp	Nữ lan			Tam Dao NP
28.	<i>Eria</i> spp	Lan tai bèo			Tam Dao NP
29.	<i>Flickingeria ritaeana</i> ( King & Pantl.) Hawkes	Lan bông		VU	Tam Dao NP
30.	<i>Hygrochilus parishii</i> ( Reichenb.f.) Pfitz.	Da báo		VU	Tam Dao NP
31.	<i>Liparis</i> spp				Tam Dao NP
32.	<i>Oberonia</i> sp	Móng rùa			Wild
33.	<i>Paphiopedilum appletonianum</i> (Gower.) Rolfe.	Hài táo	R (IA)		Wild
34.	<i>Paphiopedilum concolor</i> (Lindl.) Pfitz.	Hài vàng	(IA)		Wild
35.	<i>Paphiopedilum dianthum</i>	Hài râu	(IA)		Wild
36.	<i>Paphiopedilum emersonii</i>	Hài trắng	(IA)		Wild
37.	<i>Paphiopedilum grantrixianum</i> (Sander	Hài Tam Đảo	(IA)		Tam Dao NP

	rx Mast.) Guill.				
38.	Paphiopedilum hangianum	Hài hương, Hài hăng	(IA)		Wild
39.	Paphiopedilum helenae Aver.	Hài Helene	(IA)		Wild
40.	Paphiopedilum hirsutissimum (Lindl.) Stein.	Hài lông tím	T (IA)		Wild
41.	Paphiopedilum malipoense S.C.Chen & Z.H.Tsi.	Hài malipo	(IA)		Wild
42.	Paphiopedilum micranthum	Hài mốc	(IA)		Wild
43.	Paphiopedilum purpuratum (Lindl.) Stein.	Hài tía	(IA)		Wild
44.	Phaius mishmensis (Lindl. ex Paxt.) Reichenb. f.	Hạc đỉnh		VU	Tam Dao NP
45.	Phaius tankervilleae (Banks ex L'He'r.) Blume.	Hạc đỉnh đỏ			Wild
46.	Phalaeonopsis mannii Reichb.f.	Bướm mam			Wild, Artificial
47.	Phaleonopsis sp.	Lan bướm			Wild, Artificial
48.	Renanthera citrina Aver.	Huyết nhung vàng			Wild
49.	Renanthera coccinea Lour.	Huyết nhung			Wild
50.	Rhynchostylis gigantea (Lindl.) Ridl.	Tai trâu			Wild
51.	Rhynchostylis retusa (L.) Bl.	Đuôi cáo			Wild
52.	Thunia alba (Lindl.) Reichenb. f.	Hạc đỉnh		EN	Tam Dao NP
53.	Vanda concolor Blume.	Vanda, Huệ đà			Wild
54.	Vandopsis gigantea (Lindl.) Pfitz.	Huệ đồng			Wild

*Note: RBVN- Red Data Book of Vietnam, 1996: R- Rare, T- Threatened. ND 48- Decree 48/2002/ND-CP: IA- Strict ban of exploitation and use. IUCN, 2003- IUCN 2003 Red List of Threatened species: EN-Endangered, VU- Vulnerable, LR- nearly threatened.*

### 3.6. OVERALL NOTES RELATED TO MAINTAINING ORCHID GARDENS

- *Collection size and provenance*

Most of orchid gardens in Tam Dao Town have medium and small size collection. The owners, firstly, keep some orchid pots for personal use. Then they slowly increase their collection by collecting from the wild, purchasing from other people and also propagation by shoot separation. Long-term collections may reach hundreds of orchid pots with 10-20 species. Most of orchids have provenance from Tam Dao NP and its vicinity, some come from other areas.

The biggest orchid collection in Nui Coc Tourism Site belongs to Hoang Long Shop. The shop just buy orchids from people and maintain them for sale without proper care. The orchids were collected from the forests of Tam Dao NP, Thai Nguyen Province, Tuyen Quang Province and some from Sapa.

In “The Primary Orchid Pallas” and “Orchid Station” in Tam Dao Town, majority of their collection is from artificial propagation (tissue and shoot propagation). Some have overseas provenance. However, each facility also grow several hundreds of pots of 10-15 wild collected species for sale. These orchids were purchased from local people.

- *Growing conditions*

Most of households keep their collection under trees or bamboo roofs. The area for keeping the collection is small (20-50m<sup>2</sup>) and the orchids are placed spontaneously, lacks proper cultivating

facilities such as irrigation system, fertilizer supply, etc. Consequently, the orchids have low quality and even die during dry season.

Hoang Lan shop in Nui Coc Tourism Site accumulates relatively large number of orchids for sale, however, its keeping conditions are very poor, its owner has almost no knowledge of orchid care techniques. Therefore, many orchids die after short time of stay in this collection.

Keeping conditions of 2 largest collections in Tam Dao Town (The Primary Orchid Pallas and Orchid Station) are much better. The orchids are kept under large metal net houses and receive careful care by owners. These facilities also apply techniques of orchid tissue propagation for orchid rearing.

- *Purposes of orchid growing*

Prominent purpose of orchid growing in Tam Dao area is for sale. Some households mix both purposes for pet and for sale. “Orchid Station” of Institute of Agriculture Genetics also carries out some studies on orchid propagation.

- *Profit from commercial orchid growing*

Both “The Primary Orchid Pallas” and “Orchid Station” have commercial purpose of orchid growing. Due to recent establishment, their collections are still not large enough for mass sale, consequently, their profit from orchid growing is still limited.

Profit from other household collections is also small, representing only supplementary income for their households. Market demand for orchids in Tam Dao Area is not high and mainly because orchid-products of these households are of low quality not much attractive to tourists. Number of orchid growing households is high because the climate in Tam Dao area is very favorable for orchid growing, orchid seedlings are cheap and the people can compile both enjoying and commercial purposes of orchid growing.

- *Economic status of commercial orchid-growing households.*

All commercial orchid-growing households has economic status of moderate or higher level in the areas. Their main household income come from other production activities and benefit from orchid growing plays only supplementary role in their total household income.

- *Need of alternative income source if of commercial orchid growing prohibited.*

Due to income from commercial orchid growing does not pay very important role in overall income of commercial orchid-growing households, the ban of commercial orchid growing will not much affect their livelihood. However, it not necessary and also impossible to completely ban commercial orchid growing in such tourism centres as Tam Dao Town and Nui Coc Tourism Site. Therefore, commercial growing of non-wild harvested orchids can be allowable with strict control by local forest protection forces.

- *Market demand for orchids in Tam Dao NP area*

Presently, the market demand for orchids in Tam Dao Town and Nui Coc Tourism Site is not high due to still low number of tourists arrived. Moreover, the selling orchid-products still have low quality and usually die in short time after tourists bring them home. However, it can anticipated the increase of the market demand for orchids in near future due to increase of tourism flow to this area and improvement of commercial orchid quality.

- *Awareness on national biodiversity legislation*

Only 2 largest facilities “The Primary Orchid Pallas” and “Orchid Station” have business license. Presumably these do not allow for collection of wild orchids though, only license for tax purposes. households have no official license for commercial growing of orchids. All orchid-growing households do not know that they violate Governmental Decree 48/2002/ND-CP while keeping wild harvested orchids. Local forest rangers can not recognize wild-harvested orchids and still pay less attention to control of orchid growing in the area. Moreover, most of collections are private and small causing difficulties for them to control. Many households maintain the orchid collections in their gardens and number of local forest rangers is too small to conduct regular checking of these collections.

#### **4. PROPOSED MEASURES FOR CONTROL OF ILLEGAL MAINTAINING WILD ANIMAL AND ORCHID GARDENS IN TAM DAO AREA**

##### **4.1. Control of captive maintaining of wild animals**

- *Control of bear maintaining*

In Vietnam there is more than 2000 of bears are keeping in captivity for gall extraction. The control of this situation faces many difficulties such as high risk of releasing them back to the nature, no facilities for rescue of so large number of bears, etc. The strategy of MARD for this problem is as following: “Inventory of all captive bears throughout the Country, marking the bears by electronic chip and initiate regularly checking of each individuals. The inventoried and marked bears will be retained to their owners for further husbandry for all life span of the bears. The bear owners must sign commitment on keeping all inventoried bears, stop of trade of bears and their products, ensuring good husbandry conditions for the bears while keeping good sanitary status of environment. (Cited from Document letter no 741/BNN-KL, dated 13 April 2004 of Minister of MARD to Prime-Minister on measures of control of bears in captivity).

Local Forestry Departments will apply MARD’s instructions for control of captive bears in their province. Meanwhile, following urgent activities should be conducted:

- Education for awareness-raising of bear owners on endangered status of the bears in the wild and national legislation on bear and wildlife conservation.
- While waiting for microchip implantation programme of MARD, Provincial Forest Protection Departments should conduct inventory of all bear-keeping households, ear marking the inventoried bears, taking photos of each individuals and keeping facilities and initiate regularly checking system.
- Request all bear owners to sign commitment of not increase of their captive bears, while improvement of bear husbandry conditions (enlargement of cages, better diets and good sanitary status of keeping environment, etc.).In case, bear got sick or death the owner should timely inform local Forest Protection Department for checking. Without informing to local Forest Protection Department, lost bear can be considered as sold and the owner must receive strict punishment.
- Considering the situation that the owners of the captive bear have to pay for maintaining and feeding the bears, it possibly to allow them to continue gall extraction in limited amount, probably twice year and 50 cubic mm per extraction time. Local forest rangers must have strict control measures, such as regularly checking of bear keeping, presence in each extraction time to control of amount of bile extracted, strong punishment system for violation, etc.

- Local District Forest Protection Unit must regularly (at least, once per 3 month) check the situation of captive bears and commitment obeying by bear owners.
  - In case, bear owners want to stop keeping the bear and return the bears to government, local Forest Protection Department should cooperate with Central Forest Protection Department and Wild Animal Rescue Center in Soc Son to receive those bears and transport to Soc Son Rescue Centre for their resuscitation captive keeping.
- *In relation to Cong Vien Ca Sau (Crocodile Park) in Nui Coc Tourism Site.*
    - Forest Protection Department of Thai Nguyen Province should check license to running the mini zoo of this company. Urgent. If no license, then animals on the restricted list must be confiscated immediately.
    - Forest Protection Department of Thai Nguyen Province in collaboration with the company to inventory all wild animals maintained in the minizoo, their provenance and formulate document for monitoring.
    - Request the Company regularly (once per 6 months) send report to Forest Protection Department of Thai Nguyen Province, informing a list and number of imported animals together with their provenance, a list and number of dead animals and list and number of remained animals. All cases of animals dead should be informed to Forest Protection Department timely for checking.
    - Require the Company to stop purchasing wild animals from hunters/markets for the collection. In case of necessity, the Company should contact zoos or official wildlife rescue centres for wild animal supply.
    - Request company substantially improve keeping conditions of the minizoo, recruit properly trained zoo keepers and vets to take care of the animals. The company can work with Hanoi Zoo and Saigon Zoo to find necessary requirement of wild animal husbandry.
    - Forest Protection Department of Thai Nguyen Province should regularly monitor importation and keeping wild animals of the minizoo, and apply strict punishment for their violation.
  - *In relation to households maintaining wild animal in captivity*
    - Forest rangers of Tam Dao NP and forest rangers of buffer zone districts should conduct inventory of all wildlife-keeping households in the area, confiscate all individuals of species listed in Decree 48/2002/NDCP to return back into the wild or transport to Soc Son Wildlife Rescue Centre for further quarantining and health care process.

The animals of households maintaining non-scheduled wild animals only for pet, should be inventoried and remained in their property for further husbandry. These households should sign commitment not increase their collection through obtaining wild-caught animals and should improve their husbandry conditions. In case, the owners want to return these animals to Forest Protection Department, the Department should contact Soc Son Rescue Centre for receiving and further keeping.

Request commercial keeping households register their business with local authority and local Forest Protection Department for keeping non-wild caught animals., All individuals of wild caught provenance and threatened species should be confiscated and send to Soc Son Rescue Centre for further decision. Other species can remain in property of the owner for further husbandry. These households should sign commitment of not selling, not increase of the collection from wild stock. In case, animals died owner must inform local forest protection agency for checking

Keeping of threatened species or species listed in IB category of Decree 48/2002/NDCP should strictly forbidden.

- Permit all households carry out captive breeding of common species (only those permitted under law and only where the owner can show that either they received the initial animals from registered captive breeding sources, or that the animals are bred by themselves), however, the households should register with local Forest Protection Agency and obey national biodiversity conservation legislation.
- *Protection of Bird colony in Mr. Thanh's garden (Phan Lan Village, Dao Tru Commune)*

Because the bird colony is located in buffer zone of Tam Dao NP, it should be protected as the park's wildlife. Tam Dao NP should negotiate with Mr. Thanh to get agreement on protection of this colony (protection from any human disturbance and not to catch the birds for food and for sale). The park can give him some incentives (fund support, service offering) to encourage his protection activity. Dao Tru Guard station of Tam Dao NP should help and supervise the colony protection.

- *Awareness raising*
- Raising awareness of buffer zone people on objectives and management regulation of Tam Dao NP as well as national legislation on wildlife conservation through producing leaflets/booklets and distributing to buffer zone households. To produce and distribute posters with pictures of threatened animals often seen in trade and conservation messages for distributing in Tam Dao Town, Nui Coc Tourism Site, Tay Thien area and buffer zone of Tam Dao NP.
- Training forest rangers of Tam Dao NP and buffer zone district on identification of threatened species of Tam Dao area, knowledge on biodiversity conservation and national biodiversity conservation legislation

#### **4.2. Control of commercial orchid growing**

- Tam Dao Town has favorable climate for orchid growing. During recent years, number of orchid species and their number in the wild has been significantly reduced. Growing of orchids of artificial propagation (tissue or shoot propagation) should be encouraged to supply ever-increasing market demand on orchids and reduce harvesting pressure on natural populations. Meanwhile, harvesting and commercial growing of wild orchids (both from Tam Dao NP and other areas) must be strictly forbidden. And this needs to be enforced.
- Forest Protection Unit of Tam Dao NP should collaborate with Forest Protection Units of Tam Dao and Dai Tu District and Nui Coc Forest Protection Units to conduct official inventory of all orchid gardens occurred in the area. Special attention should pay to orchids of wild provenance. Establish system of monitoring orchid growing in the area.
- There maybe 2 possible solutions for orchids of wild provenance: 1) Request owners continue to keep these orchids without sale or transferring into other places, or, 2) Confiscate all and transfer to research or rescue facilities for artificial propagation study, such as "Orchid Station" of Institute of Agriculture Genetics or to be established rescue station of Tam Dao NP. Latter is best, especially for prohibited species. Need MOA with one of these GOV facilities,
- The species Tam Dao orchid *Paphiopedilum grantrixianum* is endemic to Tam Dao area, and holding specimens is prohibited by law therefore, all individuals of this species found in orchid gardens must be confiscated and transferred to "Orchid Station" of Institute of

Agriculture Genetics or to be established rescue station of Tam Dao NP for conservation study. MOA needs to be attached to this such that they are not simply sold back into the trade.

- Request all orchid-keeping households register to local authority and local Forest Protection Department and sign commitment of not growing wild harvested orchids, having relevant facilities for orchid maintaining in good status (large keeping ground, irrigation systems, knowledge of proper propagation techniques, etc.) and not obtaining stock from the forests.
- Forest Protection Unit (FPU) of Tam Dao NP and buffer zone districts should regularly check the orchid-keeping households and apply strict punishment to violation. The FPUs can support local mass organizations (Farmers' association, War Veteran Association, etc.) to help the orchid checkings
- Tam Dao NP can collaborate with local authority to establish "Tam Dao Orchid Conservation Association" to link orchid-lovers and orchid growers with the aim to promote orchid conservation in the area.
- Two orchid-keeping facilities in Nui Coc Tourism Site should improve their keeping conditions, recruit trained person to take care of the orchid collections. In case, these facilities do not want to improve the situation all orchid of wild provenance should be confiscated and transferred to available research or rescue facilities.
- Encourage "The Primary Orchid Pallas" and "Orchid Station" in Tam Dao Town to conduct research on artificial propagation of wild orchids, especially, orchids of Tam Dao NP.
- Train forest rangers of Tam Dao NP and buffer zone district on knowledge of orchid identification, conservation, laws and basic technical and environment requirements of orchid growing.
- Preparation of handbook on orchid identification and conservation to distribute to rangers.
- Produce and distribute leaflets or posters introducing 11 orchid species (No. 33-43 in Table 8) of Tam Dao NP with conservation measures.

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