

**MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT
FOREST PROTECTION DEPARTMENT**

**CONSERVATION AND MANAGEMENT OF WILDLIFE
IN VIETNAM**

Hanoi, December 2003

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Synonyms

MARD	Ministry of Agriculture and Rural development
BirdLife	International World Organisation
CITES	Convention on International Trade on Endangered Species
WAs	Wild animals
IAs	Invertebrate animals
NA	Natural Preserve
FSSP	Forest Sector Support Program
IUCN	International Union on Conservation of Nature
PPC	Provincial People's Committee
WWF	World Wide Fund for Nature
TRAFFIC	
UNDP	United State Development Program
FMD	Forest Management and Development

Intern

Foreword

Wildlife is an integral part of the ecosystem, they have an enormous role to play in ecological balance, they are important chain eyes in the food chain and physical circulation on earth. For human life, wildlife are source of life, they meet many needs of man, such as food supply, entertainment, science, culture, health and many other potential values. Within the Forest Sector Support Program, we would like to present to readers basic information about ecological and wildlife in Vietnam, status of wildlife in nature, artificial reproduction issues, policies of the State related to preservation and development of this resource. The manual is the collation of information, data from projects, programs, scientific reports, and policies related to management and preservation of wildlife. We hope that this manual would to a certain extent provide information on wildlife in Vietnam and look forwards to readers' feedback.

Chapter I. Overview on Biological Diversification in Vietnam

1.1. Geographical and natural conditions

The Socialist Republic of Vietnam is situated in the Eastern coastal-line to Indochinese peninsula and in the tropical region of South East Asia in the North of the equator, bordering with China to the North, with Lao and Cambodia to the West. Vietnam has a coastal-line of 3,260 km. Land area is 330,000 km² stretching her length on latitude of 15 degree. Three parts of the country: one part is central highland, with Truong Son Mountain range ranging from the North to the South and 2 riverbasins of Red river and Mekong river, in addition there are also various systems of small river-basins along the coastal line.

Vietnam has high density of rivers and streams with over 2,500 rivers and length of individual river is over 10 km. On the average, over every 20km of coastal-line there is a estuary discharging into the sea. Red and Mekong river systems are two main ones representing the North and South of Vietnam respectively.

Annual average rainfall is from 1,700mm and 1,800mm. In the mountainous areas, rainfall may reach 3,000mm/year, while in some other regions of the country the rainfall only reaches 500mm/year. Humidity in Vietnam is rather high, on the average reaching 80%. Due to monsoon regimes, raining regimes are not consistent during the whole year and distinguishing two obvious seasons, dry season during which rain is rare, wet season during which rain last for 6–7 months with shower rains. Between the Southern Central coastline areas, rainy seasons last continuously within 3 and 4 months. The North, Central Highland and South of Vietnam have rainy season continuously between May and October, and the dry season between October and April. In Central Vietnam, the wet season lasts from August to January. Upto 80-85 % rainfall focuses in rainy season.

Although, Vietnam is situated in tropical area, the climate is very different by territorial regions because of the differences in altitudes and latitude. Annual average temperature is 22–27⁰C from the North to South and lower in highland. Topographical and geographical characteristics together with monsoon regimes have created a difference in weather by regions and seasons: summer in the North is very hot and highly humid, while it is cold in the months of winter with few rains and monsoons. During springs, it is humid and dizzying. Central Vietnam, winter seems to be shorter and warmer and the rain focus during month in the end of the year, while during summer it is subject to long hot sunshines and dry winds. In the South, it is subject to all-year-round hot sunshines with 2 clear cut seasons: wet and dry.

With hydraulic, geographical, cadastral and climatic factors together with ecological ones, it has created forest vegetation covers which are fresh, thick, diversified all year round và carrying typical and distinctive features as an important part of the environment, ecology. Vietnam tropical forests have high value of natural resources and important role towards the social – cultural lives of people and country.

Vietnam with population of over 80 million people under 54 different fraternal ethnic groups is one of the most populous countries in ASEAN countries. Over 80%

of population live in rural areas and 75% of rural population live entirely based on agricultural and forestry activities. Forests provide timbers, fuel wood, bamboos, rattans and other non-timber products satisfying domestic and export demands.

1.2. Riches of fauna and flora

With climatic, hydraulic conditions mentioned above, Vietnam is considered as one of world biological diversification centers. Regional flora of Vietnam is estimated to have 12,000 high-class varieties of veined flora but up to now there have inventoried only 9,628 varieties (accounting for 80%) under 2,010 offshoots and 291 families (Phan Ke Loc, 1997), of which there are up to 1,000 endemic local varieties. 1,000 varieties can be able to provide timbers, 100 varieties are dominant timber plants, 352 varieties are commercially valuable, 50 varieties are high-quality timber trees and 42 precious varieties. There are around 76 varieties supplying aromatic spices, 600 varieties that provide tannins, 160 varieties that contain vegetable oils and various other varieties are precious herbal medicine such as ginseng, *Coscinium fenestratum*, *Coptis teeta*, *Pseudo Ginseng*, *Stephania* spp...

Regional flora of Vietnam falls in a category that has rich composition of varieties in the world (in comparison with other regions that have the same area, it only ranks second to those of some tropical areas in South America or Indonesia, approximately equivalent to that of African tropical humid area and exceeds those of subtropical and especially temperate areas). For example: number of varieties in the flora of Cuc Phuong national park (250km²) is approximately equivalent to that of Poland (330,000km²). For the past 10 years, scientists have discovered additionally around 300 new varieties to contribute to science and Vietnam from Vietnam flora (Regalado, et al., 2003). Of which, there are new offshoots for science namely *Xanthocyparis* with 1 variety *X. vietnamensis* under pine tree group which is very precious and rare (Farjon A., et al. 2002), Fern *Caobangia* and various offshoots under Orchid family: *Vietorchid* (with one variety *Vietorchis aurea*), *Zeuxinella* (with one variety *Zeuxinella vietnamica*) etc... With authentic scientific evidence, Vietnam is considered as the high-class diversification center in the world regarding *Cycas* with 24 known varieties (Nguyen Tien Hiep, et al. 2000) and *Paphiopedilum* with 22 varieties (Averyanov L. et al. 2003).

With regards to animals, besides endemic varieties Vietnam also possesses animal species which bring general characteristics of the regional fauna in South China, India, Malaysia, Myanmar. Various species have high economic, scientific value, many species listed in the Vietnam and World Red Books. The riches in flora and ecosystems are home to various species of animals. Vietnam has up to 11,217 species of animals, of which there are up to 1,000 species and subspecies of birds, 270 species of mammals, 349 species of reptiles and amphibia, over 2,470 species of fishes, over 300 species of corals together with various species of invertebrates. Especially during 90's there were 4 new species of mammals found in Vietnam: *Megamuntiacus vuquangensis*, *Canimuntiacus truongsongensis*, *Pseudoryx nghetinhensis* and *Muntiacus puhoatensis*.

1.3. Types of ecosystems and forests in Vietnam

Vietnam has a large range of forests with various forest ecosystems which are typically in tropical monsoon way:

Evergreen broad-leaved forest: This type of forest is a mixed forest of between populations of tropical plant families such as Fabaceae, Fagaceae and Lauraceae grown on hill and low mountains lower than 800m in the North and 1,000m in the South. There are a lots of all-year-round evergreen forest parts with forest trees at different ages. Beside dominant timber trees, many trees with medium measurements at a high level and various varieties of shadowed plants developed strongly under forest crown. Many forest trees live on skin of living organisms, or aerial roots such as orchid, grass creepers and various varieties of timber creepers are also found in this type of forest.

Evergreen broad-leaved tropical on lime and Karst mountains: Vegetations are rather diversified covering lime-mountain range with advantage by evergreen trees and small ratio of deciduous trees. This type of forest provides beautiful-veined timbers serving for high-class woodwork. Various of endemic plants are found in this type of forest such as *Parapentace tongkinensis*, *Dacrydium pierrel*, *Fagracea fragans* and *Diospyros mun*.

Many evergreen broad-leaved forests are considered as natural tropical wonders of the world. Since prehistoric men inhabited in these forests, various vestiges of the prehistoric men in Vietnam have been discovered in caves and grottoes in lime-mountain ranges in Bac Son, Hoa Binh, and Cuc Phuong national park – the first representative for this type of forest.

Evergreen broad-leaved sub-tropical forests on high mountains: This type of forest has large range all over at the altitude of 800m in the North if the country. Vegetation cover of this forest type includes plants of the family Fagaceae, Lauraceae, Ericaceae, Woodsioiaceae, Bambusacea... This type of forest is also home to plants that live on skin of living organism, aerial roots such as orchids, *Asplenium nidus* and herbal remedy trees.

The ground is covered by a large number of valuable herbal remedy trees, such as especially *Amomum longiligulare*, *Amomum tsaoko*, ginseng.

Dipterocarpaceae dry forest: this type of forest is distributed in some certain areas in Central Highlands, Southeast of Vietnam, including Southern coastal lines, in general this type of forest often exists at the altitude of 1,000m with two obvious separate seasons wet and dry. Composition of plants include deciduous and evergreen plants with different dominant ratios of **Dipterocarpaceae (các cây họ dầu)**.

Pinaceae forest: at the altitude of 1,000m in the South of the country is favourable for these pinaceae trees to develop such as pine trees e.g. *Pinus merkusii* and *Pinus khasya*. Therefore, Lam Dong highland is a famous place with large pieces of forest. Various places where pine tree grow mixed with varieties of broad-leaved **Dipterocarpaceae** which are typically of subtropical evergreen forests at the same altitude and rainfall.

Mangrove forest: Typical varieties of mangro forests include trees of the families *Rhizophora mucronata*, *Rhizophora conjugata* distributing along the coastal line. At the southern tip of the country (Ca Mau cape), two dominant varieties are *Bruguiera gymnorhiza* and *Sonnerata alba* with large-trunk trees which are up to 15m creating mangro forest areas covering hundreds out of thousands of hectares of mangro forests. Mangrove forests are home to various populations of animals such as crabs,

turtles, tortoise, snakes, crocodiles together with various species of birds and mammals.

Warm weathers as well as rich food source have made mangrove forests in quiet shorelines a home to indigenous species of birds and shelter to migratory birds from Siberia to avoid cold from the North.

Indigo forest: indigo trees grow well on Sulphate acid soil in the Mekong Delta. Indigo forests here grow closely and densely with a lot of individual trees which are 10-15m. Under favourable conditions, indigo trees develop quickly. Indigo timbers can be used as supporting columns, fuel wood and charcoals, especially indigo flowers are favourites for honey bees. Fauna in the indigo forests are specially diversified with various species of fishes, tortoise, snakes, crustaceans, mollusks ... In practice, indigo forests have an important role in improvement of sulphate acid soil and keeping freshwater.

Bamboo forest: bamboo forest can be purely standing or mixing with other species of timber trees of rain evergreen or deciduous forests all over Vietnam. Bamboos is a kind of trees that can be suffering from flood, are small and easily growing, they develop quickly on flat and hilly terrain, or along streams' banks with different short life spans of 2 - 4 years, bamboo are valuable with various different types of goods. Bamboos can be used as construction material, paper making, fiber products, hand-made articles and even food. Therefore, bamboo forests have been familiar with various Vietnamese generations.

Wetland areas: Vietnam has a large wetland, include various different forms: estuaries along coastal line; systems of lagoons, reservoirs, bays; Dong Thap Muoi water inundated area; systems of natural lakes, artificial lakes and other in-land water inundated areas, together with tens of thousands of ponds, large lakes ranging from the North to South of the country.

Sea ecosystems: According to inventories, Vietnamese seas have 537 species of ephemeral plants, 657 species of ephemeral animals, 600 of alga, 35 of salt-marsh plants, 650 of coelenterates, 2500 of mollusks, 1600 of crustaceans, 700 of polychaeta, 350 of Echinodermata, 150 of spongia and over 2,033 of fishes. Above mentioned data show that Vietnamese sea is one of sea areas in the world that possess abundant and rich regional living system. Up to now, Offshore Vietnam have also recorded to be important living habitats and migratory routes of other mammals such as whale, whale shark and shark. Offshore Vietnam, scientists have noted 15 species of dolphins and 1 of horn whale.

Ecosystem for coral reef, sea grass and mangrove forests in Vietnam is also home to various living species such as mammals, reptile and sea birds. Up to now, in addition to 2,033 species of fishes found, there are also some world important species of animal, of which there are in full 5 species of sea turtles. All these 5 species are in danger of extinction which are namely green turtle (*Chelonia mydas*), Loggerhead turtle (*Caretta caretta*), Olive ridley (*Lepidochelys olivacea*) and two species which are in higher level danger of extinction which are namely Leatherback (*Dermochelys coriacea*) và hawksbill turtle (*Eretmochelys imbricata*).

Sea cow (Dugong) which is being in alarming and pressing danger of extinction, is also another precious asset of sea diversity in Vietnam. This is a species of slow moving mammals inhabiting in shallow seas which is abundant in grass, for example in Con Dao island's sea. (Võ Sỹ Tuấn, Hon Mun Project).

1.4. Diversity and its importance

Biodiversity is the abundance of living things on earth, biodiversity show at different levels from molecule level (cells, DNA molecules...) to that individual, species, population, community of different ecosystems and including the society of mankind. According to the Diversity Convention which Vietnam have become a member since 1992, biodiversity is defined as abundance of living things of all living sources including terrestrial ecosystem, marine ecosystem and other underwater ecosystems, and a collection of ecosystems of which living things are just a part: biodiversity includes diversity in one specie, diversity among species, and diversity among ecosystems. In other words, biodiversity is the diversity of livings at different levels and in different combinations.

The biodiversity is actually a very new concept, has only appeared for dozens of years. In Vietnam, biodiversity concept started to appear during early decade of 90's, with three main levels namely ecosystem diversity, diversity on species and genetic diversity.

Importance of biodiversity: Genotypes, species and ecosystems on earth are products of 3-billion-year evolution process and they are foundation for existence of our mankind. Biodiversity is not only valuable by their usages and beings but also by its potentials of future values which can not be predicted now. Their values and beauties show immediately in abundance of species, genotypes, ecosystems and as the knowledge by human on ecosystem is still so modest that is not possible to evaluate impacts of the loses they made to certain ecosystems.

Living organisms on earth live and exist thanks to safeguarded ecological balance. Ecosystems are balanced by that living organisms in certain communities stabilise their populations in terms of number, density and species are strongly correlated and connected through food network and sequence (this specie is prey of others but at the same time predators to others). If a species is lost, balance will be broken. For example, when specie of mouse-snake is lost, number of mouse individuals will increase strongly... point of ecological equilibrium will be shifted to the other position. That forests are being cut down illegally, soil are heated up, water evaporates fastly and strongly has made quantity of underground water decreases causing draught. Forests are lost that cause erosion and worn out.

In the old days man used and lived on produces of nature such as bulbs, fruits, leaves, wild forest meats as food and medicine, shelters and clothes. When mankind's civilization developed, the more and more natural resources have been being exploited for uses. There are up to 75,000 varieties of edible plants, 2,000 species tamed of which 30 species supplied up to 90% nutrition in the whole world. Profit gained from aquiculture products in Vietnam annually reaches 2.5 billion VND, from the terrestrial wild estimated to be 20 million USD and from flowers, ornamental trees also achieved up to 10 milliion USD (Biology Faculty, Natural Science University).

Potentials of biodiversity are great, however, up to now there is only around 5% plant varieties have been studied to serve humans, the remainings are still potentials for future uses.

Natural landscapes can be perfect without the presence of plants and trees, and animals. Therefore, biodiversity has a great value in terms of beauty, flowers, ornamental trees and holiday resorts, places of interests which are products of nature and of living organisms.

1.5. Causes for declination of biodiversification:

There are various causes that lead to damaged ecosystems and declined biodiversity, including indirect causes such as poverty, people's poor awareness of natural conservation, people's poor observance of law on natural conservation and biodiversity; and direct causes, that is, people's impacts on natural resources and various ecosystems as follows:

- Over-exploitation.
- Shifting cultivation
- Encroachment for agricultural land.
- Over hunting, poaching and trading of wild plants and animals
- Forest fires
- War
- Environmental pollutions

1.6. Policies and basis for preservation of biodiversity in Vietnam

National preservation strategy was formulated in 1985 with the following objectives:

- Meeting basic cultural, spiritual and materialistic needs of local people for today and tomorrow generations in intelligent mangement of natural resources.
- Determination and formulation of policies, plans, organisation and actions so that the sustainable use of natural resources fully intergrates with all aspects of socio-economic developments of the country.

National plan on environment and sustainable development in 1991 reviewed the National Preservation Strategy in 1985.

Forestry policies was reviewed during the process of formulating Tropical Forestry Action Plan (1992). The Decision No. 327 by the Council of Ministers stressed the importance of forest protection, restoration of bare land for effective production and Farming on slopy lands. The Program 327 allowed to allocate forest land by long-term land use right certificates to encourage local people to afforest, restore forests and they were beneficiaries of the forest.

Objectives and guiding principles of 5 million hectar afforestation programme are clearly described in the Decision No. 661/QĐ-TTg; both afforesting 5 million hectares and safeguarding effectively 9.3 million ha of existing forests, aiming at ensuring environmental security, providing sufficient information non-timber forest

products for industrialisation process, at the same time stabilising and improvement for living conditions of local people in midland, mountainous areas especially in ethnic minority areas. The Decision clearly stated the guiding principle was to mobilise collected efforts of the whole people to afforest, manage and protect on a sustainable basis; in the meantime, mobilising every resource, every sector of the economy to develop forests in the period of 1998- 2010.

The Ministry of Agriculture and Rural Development approved the Provincial Forest Strategy for the period 2001 – 2010 under the Decision 199/QD/BNN-PTLN in 2002, giving priorities to developing the 5 Million Ha Reforestation Program, forest development and sustainable management program, forest resources changes monitoring and training program.

Recently, Prime Minister signed the Decision No.192/2002/QD-TTg approving a Management Strategy for a Protected Area System in Vietnam to 2010. This strategy if materialised, then series of actions will be implemented to meet requirements for sustainable economic developments by local people and social - cultural preservation and biodiversity in preservation zones.

With regards to control of pollution, Ministry of Natural Resources and Environmental is step by step introducing a series of industrial standards to control on pollution as well as precedures for environmental impacts assessment (EIA).

1.7. Legal basis and legal documents related to preservation of wild animals and biodiversity

- Land Law 2003
- Decree on mineral resources in 1989
- Decree on watersource protection in 1989.
- Maritime law in 1990.
- Forest protection and development in 1991.
- Environmental protection law 1994.
- Decree No. 18/HDBT by the Council of Ministers 1992 (revised, amended, by Decree No. 48/2002/ND-CP)
- Convention on biodiversity preservation in 1994.
- Biodiversity Action Plan in 1995.
- Vietnam participated in Convention on International Trade in Endangered Species (CITES) in 1994.
- Decree No. 11/2002/ND-CP on management of export, import and in-transit of wild animals, in 2002.
- Ordinance on Aquatic Resources Protection in 2000.
- Procedures for managing three types of forests: special-use, protection and production forests and natural forests issued in attachment to Decision No. 08/2000/QD-TTg in 2000.
- Forest Development Strategy by the year –2010 by MARD

- The Strategy for a Protected Area Management System in Vietnam , 2003

Chapter II. Wild animals in Vietnam

Animal is one essential part of living creatures, very diversified and rich in the biosphere of the earth. Animal kingdom has an important role in nature and lives of human beings. It is hard to define the number of animal species on earth, figures are only forecasted. There are approximately between 5 and 10 million species, which are divided into two sub-categories: multi-cellular and uni-cellular animals. In the division of multi-cellular animals, there are different animal phyla.

2.1. Invertebrate animals (Spineless animals):

Invertebrate animals account for the largest share in the animal kingdom, which are divided into two main groups namely proteozoic animals (Protozoa) and multi-cellular animals (Metazoan). They have very diversified and rich bodily forms and structures (from unicellular animals whose bodily structures are formed by a single cell but have sufficient organs to self-ensure minimum basic living activities to multi-cellular animals with complicated bodily forms and structures). They can adapt to and are distributed scattering all over the earth and in almost habitats, even in very difficult living conditions where other animals can not survive (e.g. mountain tops, oceanic bottom, hot springs...).

Main feature of invertebrate animal is that they are spineless inside their bodies. Depending on the levels of evolution, the body of some groups can have external bones to act as support to body and self-defense (against insects, crustacean...).

In the whole animal kingdom, there are 36 phyla, of which invertebrate animals comprises 34 phyla with approximately over **1.5** million species (Thai Tran Bai edition, 2001)

Geographic distribution of invertebrates

So to say, invertebrates can be found in almost natural habitats. In Vietnam, the biodiversity shows the plenty of species and their distribution. With the complex geographical conditions in Vietnam, various species of invertebrates are distinctive ones ,that can be found in some certain areas.

a. Invertebrate fauna in Viettnam.

Marine invertebrates

By then, regional marine invertebrate fauna in Việt Nam has identified 10 phyla including 60 layers, of which the insect layers (Insecta) live completely in fresh water, 31 layers at seas, 8 layers both in fresh and sea salt water.

Vietnam has found around 303 species of corals and 200 species of hydrozoa offshore, including 62 species of coral SAN HO TAO RAN. The Crustacea with a plenty of individual species plays a vital role in the sea since it becomes indispensable food of other marine aquatics

The Mollusca includes species living in the sea bottom that usually move slowly and have hard cover. However, out of about 2500 species of the Mollusca in Vietnam sea territorial water, nearly 200 species adapt to living adrift in the seas,

mainly species of the Pteropoda.

Some species only dwell in brackish water such as clamworm. Of around 255 species of sea shrimps are found in the territorial sea water of Vietnam, there are 58 species in the Northern water, 78 species in central seas and 50 species in the south; Only 47 species have been found in one particular sea area and 139 species in various sea areas nation-wide.

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b. Importance of invertebrates.

Invertebrates have important roles in nature as well as in life of human beings. They are indispensable part in the ecosystems, contributing to various important processes of metabolism in nature. They can be used as food, fertilizer, precious medicine and material source for industry, ... simultaneously as inspectious carriers and directly cause various different diseases for fauna and flora in nature, of which human beings are included.

With composition of species and number of individuals account for overwhelming majority in the animal kingdom, large range of distribution and ability of adapt to various different terrains, it is understandable that vertebrates play an important role. Some major roles that they play as follows:

- An indispensable part of ecosystem in nature.
- Invertebrate has large quantity with various diversified living forms, therefore they play a significant roles of natural material circulation cycles in nature. They participate in and are an important link in food chain and network in nature with the roles as consumption living things.
- In the process of evolution, various species of invertebrates have formed instincts of parasites, communalism, symbiosis or flesh eating for other species of animals.
- Provision of various precious products, materials for various industries such as silks, bee honeys, red stick-lac, pearl, ...
- Most of invertebrate species having strong offspring capacities, great number of individuals and easy to raise and foster therefore they are frequently used in biological and medical studies. Vinegar fly (*Drosophila melanogaster*) is a perfect example. Through studies on vinegar fly, various important genetics laws have been being discovered and proven.
- However, so many insect species also cause great harms to human's activities: various insects cause harms to the production of agriculture and forestry. The world history has recorded grasshopper plagues occurred. Various plagues of pine tree's pestilent insects, caterpillars, styrax's pestilent insects... have occurred, eating all trees' leaves of thousand hectares of forest. Various species are causes to dangerous diseases to animals and humans: such as **Amp**, whiplike worms, dengue fever mosquitoes, bubonic plague transmission fleas, parasitic worms to humans, ...

2.2. Subphylum Vertebrate (vertebrate sub-division):

In the phylum Chordata, scientists divide it into different subphyla: sub-division

Urochordata, sub-division Cephalochordata, sub-division Vertebrata.

Sub-division Vertebrata is a large one, separated from its ancestors and follow active ways of living, therefore their moving organs develop, which entails the development of the remaining body organs. In general, their structures are having some characteristics in common.

In term of shape: their bodies are divided into three parts: head, body, tail. For the terrestrial groups, they have an additional part, which is the neck. Movement organs are legs. Skin comprises of two layers: an outer, protective layer (epidermis) and an inner living layer (dermis). Medium bone system is both a bodily skeleton and protective structures to cover inner organs. Muscle system has two kinds: corresponding vein muscle with moving body organs under the control of central nervous system; viscera muscle is smooth muscle in the internal organs controlled by vegetative nervous system. Digestive system division tubes and tracts, each organ has its own function. Respiratory system, underwater vertebrate animals respire by gills, terrestrial vertebrates by lounge. Circulatory system is a close one, which has a strong heart pumping up blood to all parts of body. Blood vessel system is very much developed (artery, vein and capillary). Nervous system gathers to form a spiral brain, the brain is placed inside skull, medulla inside mental curve of vertebra. There are 5 main senses: hearing, sight, smell, taste, and touch for which stimulation from inside and outside body is received for evaluation and response. In vertebrate animals, Excretory organs concentrated to form a kidney complex, for reptile, bird, and mammals in particular back kidney has the complete function to filter, remove waste product, adapt to terrestrial lives...With all above-mentioned features of their bodies, it is proven that vertebrates have much more complex advanced organization and evolution against other phyla.

In the world, scientists have classified around 50.000 species under 10 classes, falling into 2 main groups:

The group Agnatha:

- The class Pteraspidomorphi: now extinct
- The class Cephalaspidomorphi: now extinct
- The class Cyclostomata

The group Gnathostomata

There are two superclasses including 7 classes:

Superclass Pisces:

- The class Aphetohyoidea: now extinct
- The class Chondrichthyes
- The class Osteichthyes

Superclass Tetrapoda:

- The class Amphibia
- The class Reptilia
- The class Aves

- The class Mammalia

2.2.1. Superclass Pisces

Fish is vertebrates living in water, including 3 classes: scallops fish with round mouths, Cartilage fish and bony fish. Round mouth fishes are not noted in Vietnam. Cartilage fish range their distribution in the seas, very few entered rivers' estuaries to find preys. Fish adapt watery lives, respire by gills and use their fins to move through water.

Cartilage fish (Chondrichthyes): Almost live at seas, bodily organization in general is still low, with the basic characteristics is that their skeleton is of cartilage, some spots soaked with calcium. Modern cartilage fishes (Chondrichthyes) have around 600 species, divided into 2 subclasses: 1) subclass Elasmobranchii including various species of cartilage fishes with gill's slits straight outside without cover membrane, powerful hinged jaws attached to skull, including 2 superorders:

- Superorder Selachomorpha have various species in 8 orders with following characteristics: lozenge body, breast's fins located along body sides, strange-shaped tail fin, having anus's fin, gills' slits located both sides of the head, acute and sharp teeth. Carnivorous, fast swimming, active range in water surface, range of distribution in tropical and subtropical seas.

- Superorder Ray: Rays have broad, flattened bodies, pectoral fins are extremely well developed and extend from the tail to the sides of the head, gills located on the lower. Blunt teeth adapted for crushing preys on which they feed. Swimming slowly. The creatures inhabit the ocean bottom. Range of distribution is in tropical and subtropical seas.

The class Osteichthyes (the bony fishes): is in the largest number of subphylum vertebrates, large range of distribution in Vietnam both in freshwater and salt water. Osteichthyes is polymorphic, popular form is flat-side lozenge. The skeleton is completely made of bone in replace of cartilage.

Modern Osteichthyes are divided into 4 sub-classes:

Actinopterygii (ray-finned fishes) is the largest subclass. Species often seen in Vietnam: *Dasyatis*, *Rhynchobatus*, *Raja*, *Aetobatus*, *Pristis* and *Narcine*.

Vietnam has high diversity on composition of species in general, that of local species in particular. Up to the moment, scientists have discovered in Vietnam there are 544 species of local fish species under 228 breeds, 57 families and 18 orders (Nguyen Tan Trinh at. al, 1996). However, various species continue to be discovered. The total of sea fish species noted is 2,033 of 717 breeds and 198 families, 70% of them are in bottom of seas. Vietnam's sea fishes important tropical fish species with very low ratio of temperate fish species ranging mainly their distribution in the Gulf of Tonkin. Studies ở coral reeves also noted 346 species living in close alliance with this sensitive ecosystem (Vietnam Action plan ĐDSH, 1995).

Local species of fishes in Vietnam:

No	Names of orders	Numbe	Numbe	Group	and
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	Vietnamese names	Scientific names	r of Family	r of species	grouping
1	Bộ cá cháo	Elopiformes	2	2	2
2	Bộ cá sứa	Gonorhynchiformes	1	1	1
3	Bộ cá trích	Clupeiformes	2	11	22
4	Bộ cá thát lát	Osteoglossiformes	1	1	2
5	Bộ cá hồi	Salmoniformes	1	3	3
6	Bộ cá chình	Anguilliformes	2	2	6
7	Bộ cá chép	Cypriniformes	4	100	276
8	Bộ cá nheo	Siluriformes	10	31	88
9	Bộ cá sóc	Cyprinodontiformes	2	4	5
1	Bộ cá kim	Beloniformes	2	4	5
1	Bộ cá ngựa xương	Gasterosteiformes	1	1	1
1	Bộ cá dúi	Mugiliformes	2	3	4
1	Bộ mang liềm	Synbranchiformes	2	3	3
1	Bộ cá quả	Channiformes	1	2	8
1	Bộ cá vược	Perciformes	17	44	70
1	Bộ cá bơn	Pleuronectiformes	4	5	22
1	Bộ cá chạch sông	Mastacembeliformes	1	2	7
1	Bộ cá nóc	Tetrodontiformes	2	7	13
Total			57	226	538

2.2.2. The class Amphibia

Amphibia is a terrestrial vertebrates but has their lives attached to watery environment. To adapt, they have the following basic characteristics as follows:

- Hairless, soft and moist skin (scaleless)
- Often have 4 legs (except *Ichthyophis glutinosus*)
- Front legs having 4 toes, hind legs having 5 toes;
- Tailless (except *Ichthyophis glutinosus* and *Paramesotriton deloustali*)
- Laying eggs in mucous membrane, egg's cover not tough and hard.

Amphibia is Poikilotherm which their bodies' temperatures changes in accordance with semi-water cum semi-terrestrial habitats which require temperature and moisture. Amphibia range mainly in tropical areas. The further up to temperate regions, the less number of families and species of Amphibia become. Temperature limit of Amphibia is 40⁰C and they will be frozen at 7-8⁰C.

Amphibia in Vietnam is very diversified and rich and diversified. Up to now, we have noted 80 species under 9 families, 3 orders and under 3 groups: Amphibia with tails (*Paramesotriton deloustali*), Amphibia without legs (*Ichthyophis glutinosus*) and Amphibia with tails (home toads, young frogs, *Hylarana*; racophorous, various species of frogs, tree's toads). Amphibia often live in wet and close to water areas, most activities during the night-time and range mainly in tropical areas. Species which have a large range are home toads, young frogs, *hylarana*, rice-field frogs, leaf frog... some other species live in forest such as smoot-skin frogs. Species which have a limited range and are rarely seen are *Paramesotriton deloustali*, fire-bellied toads, toothed frogs.

Frogs are Poikilotherm, their lives are affected obviously by external factors such as temperature, moisture, water source, lights, winds, food source, carnivores. The Vietnam red book 2002, some species have been noted into directory of precious species such as *Paramesotriton deloustali*, *Rana andersoni*, *Rana microlineata*, *Ichthyophis glutinosus*

Vietnam has recorded 80 species about 80 species under 9 families, 3 orders:

Vietnamese names	Scientific names	Vietnamese names	Scientific names
I. Bộ có đuôi	Caudata	4. Họ cóc bùn	Pelobatidae
1. Họ cá cóc	Salamandridae	5. Họ cóc	Bufonidae
II. Bộ không chân	Apoda	6. Họ nhái bén	Hylidae
2. Họ ếch giun	Coecillidae	7. Họ ếch nhái	Ranidae
III. Bộ không đuôi	Anura	8. Họ ếch cây	Rhacophoridae
3. Họ cóc tía	Discoglossidae	9. Họ Nhái bầu	Microhylidae

2.2.3. Reptilia Class

Reptiles are the first vertebrate formally live on land, completely independent from watery environment. However, there remain some species live mainly in water (tortoise, crocodile, and sea snakes ...). This is secondary phenomenon (in the process of evolution, reptiles expanded their range of habitats to water). They have characteristics that make them adapt to terrestrial lives, as follows:

- Reproduce on land, eggs contain a lot of citellus, embryos have urinary bags which have excretory roles and have amnion to protect embryos.
- Dry skin, few glands, with scales to protect body from water loss, respire completely by lungs.

Reptiles at present are grandchildren of mesozoic reptiles, when reptiles developed dominantly, had a wide range on land and at seas. Today, reptiles remain around 6,547 species under 4 orders (previously was 17 orders): Order Rhynchocephalia, order with scales (Squamata), Order Chelonia, Order Crocodilia. Reptiles have larger range than that of Amphibia. Most of them live in tropical areas, large range in wasteland, deserts. At seas (snake and sea tortoise), in brackish water, freshwater (Colubridae, turtle, large-head tortoise), in burrows (worm snakes, cobra, *Leiolepis guttata*). Most species of snakes live on water surface, on trees (various species of

gecko, salamanders, rattle-snakes). Some species are active in either 2 or 3 different habitats such as: Iguana, physignathus. Most of reptiles are carnivores, some species omnivorous such as freshwater tortoise and some species of turtles, and very few eat botanic foods such as yellow tortoise and some freshwater tortoises.

Vietnam has recorded 270 species of reptiles under 23 families, 4 orders and include groups: house geckos, gecko, lizards, iguana, python, snakes, tortoise, pond turtle, crocodiles. Of various precious species such as: *Eretmochelys imbricata*, *Chelonia mydas*, *Ophiophagus hannah*, *Crocodylus porosus*, *Crocodylus siamensis*, species of box tortoise Cuora breeds...

Vietnamese names	Scientific names	Vietnamese names	Scientific names
I. Bộ có vảy	Squamata	13. Họ rắn nước	Colubridae
1. Họ tắc kè	Gekkoniadae	14. Họ rắn hổ	Elaphidae
2. Họ nhông	Agamidae	15. Họ rắn biển	Hydrophiidae
3. Họ thằn lằn bóng	Scincidae	16. Họ rắn lục	Viperodae
4. Họ thằn lằn giun	Dibamidae	II. Bộ rùa	Testudinata
5. Họ thằn lằn chính thức	Lacertidae	17. Họ rùa da	Dermochelyidae
6. Họ thằn lằn rắn	Anguidae	18. Họ vích	Cheloniidae
7. Họ Kỳ đà	Varanidae	19. Họ rùa đầu to	Plasternidae
8. Họ rắn giun	Typhlopidae	20. Họ rùa đầm	Emididae
9. Họ rắn hai đầu	Anilidae	21. Họ rùa núi	Testudinidae
10. Họ rắn mỏng	Xenopeltidae	22. Họ Ba ba	Trionychidae
11. Họ trăn	Boidae	III. Bộ cá sấu	Crocodylia
12. Họ rắn rằm ri	Acrochordidae	23. Họ cá sấu	Crocodyidae

2.2.4. The class Aves (Bird)

Birds belong to a group of vertebrates that possess highly organised and structured bodies help adapt as a flying creature. Organs within their bodies are structured in a way to minimize weight, spongy and soft bone, bodies have pockets of air, respire double... With regards to evolution, birds are closer to reptiles and was a evolution branch of reptiles. Their bodies are covered with feathers, front legs have been converted to become wings, and jaws are toothless, lightweight jaws become beaks. Typical birds have short body, small heads, short tails (excluding tail feather), 4-chambered hearts, blood in artery is separate from that of vein.

With regards to classification, birds are classified into 2 superorders:

- The superorder Paleognathes, at present there remain 25 orders of birds including 56 species under 15 breeds, main orders include: Order Struthioniformes (African ostrich), order Rheiformes (American ostrich), order Casuariiformes (Australian ostrich), order Apterygiformes (birds without wings)
- The superorder Neognathes: Order Sphenisciformes (penguin), Order Pelecaniformes (pelican), order Anseriformes (geese), order Phoenicopteriformes (flamingo), order Gruiformes (Crane), order **Rẽ**, order sea-gulls, order chicken, order Columbiformes (pigeons), order **Cát**, order Strigiformes (owls), order Psittaciformes (parrots), order Cuculiformes (Cuckoos), order **gõ kiến**, order Caprimulgiformes, order Passeriformes (sparrows), order **sả**, order **sẻ**.

Based on various characteristics, birds are divided by various groups: By where the birds come from and their living conditions (birds of forest, hill, mountains, urban or rural, water), by diets (eaters of flesh, soft fruits, seeds, insects), by characteristics of living place (fixed settlements and make nests, migratory birds). Bird has a wide range everywhere in the World, in the northern pole there are 4 species of birds; in the southern pole there are sea swallows. Birds are present in the Himalaya range which is 7000m high or in African deserts. Such adverse living conditions during the winters (food, coldness, shorter daytime...) have affected a great deal on bird normal living conditions that leads to migrations. In Vietnam during around October and November there are many species of birds migrating from the North to Vietnam such as :anas creeca, wild ducks, wild goose, cranes, wagtail...totaling up to 227 species of birds, until March these species of birds return to their original places.

Vietnam has inventoried about 833 species under 60 families and 19 orders (however, the methodology of classifications is be somehow subject to change).

Vietnam's Aves class is distinctive, rare and precious. It includes a great number of precious species in the lists of birds under trafficker bans (CITES Annex) under hunter bans (Group I, II under the Decree 48/CP) and a plenty of endangered species as specified in international, regional and national Red Books such as: *Lophura diardi*, *Lophura hatinhensis*, *Lophura imperialis*, *Lophura edwardsi*, *Tragopan temminckinensis*, *Lophura nycthemera*, *Arborophila davidi Delacour*, *Polyplectron germaini Elliot*, *Rheinartia ocellata ocellata*, *Buceros bicornis Linnaeus*....

2.2.5. Class Mammalia

Mammalia is the class vertebrate that have nervous systems highly developed and adapt flexibly. They occupied most of living environments on earth, from highlands, thick tropical forest to deep seas. Up to the moment, with around 4.500 species, mamamia only account for 0.5 % of total species of animals existing and developing in the world.

Mammalia together with fishes, amphibia, reptiles and birds form the sub-phylum vertebrate most typical characteristic is that their bodies are supported by a firm axis which is called spine. Spine together with other parts of skeletons form a supporting

structure for the whole body. In comparison with other groups of vertebrates, mammalia is the most evolved. This shows in the following characteristics:

Mammalia's bodies are mostly covered by hair or furs. On their bodies have exocrine glands which have an important roles such as mucous glands, perspiration glands, milk glands, waste glands, ... of which trong đó mucous glands and perspiration glands functioning in the adjustment of body temperatures. Some species of mammals such as dogs lacking perspiration glands on their bodies while in their mouth cavities, on their touge surfaces, there are various mucous glands functioned as the roles of perspiration glands.

Nervous system of mammals is extremely developed. In mammals, a new type of skull is developed and central air-conditioning part of the body is in central nerve. Nervous system is such developed that it also give the animal to have complicated instincts(making nest, nursing children, seeking preys, hiding away from enemies, ...) which have made them adapt more quickly to changing and challenging living conditions.

Mammals give a birth and raise their offsprings with milk. Embryos developed inside mother's abdoments to make sure their embryo be safe in all adverse situations, be provided with nutritiions through placenta. Once come to life, the babies are raised on milk – a diet that have in full nutrient substances necessary for a body development that any other food in nature can be comparied.

Mammal's blood include white cells and having no nucleus and two concave ends to increase areas for oxygen absortion. Mammal's hearts have 4 chambers theirfore oxigen-contained blood (in artery) is not mixed with carbonic contained blood (in the vein), the particular characteristic have a positive impact to boost process of metabolism inside body, help mammals be able to regulate body temperature within a certain range and independdent from changes of outside temperatures.

In addition, mammals possess other features which help boost ability to survive of their bodies and maintain the strong development of their races: their teeth are specialised teeth divided into 3 kinds; front teeth, eye-tooth and molar teeth which have different functions; Lower jaws which contain only integrated piece of bone (while other classes of Vertebrates, jaws made of various pieces joined) are therefore stronger, help mammals to catch preys more effectively ...

In the history of evolution, earlies species of mammals have appeared around 180 million years ago. However, during that time - around 100 million years – ancient species of mammals did not developed more in number. Only 60 - 70 million years ago, when ancient reptiles were extinct is just before the time mammals entered in an era of triumph: appeared many more species of mammals with the increasing number of individuals. Triumph period was around 25 million years – when there

were 1,200 different breeds (each breed again contain various species). However, up to now, under the impacts of natural selection as well as rampant exploitation by humans, in the world there remain only around 1,000 different breeds with around 4,500 species.

a. Sketches on classification of mammals

Even though being generally grouped in the class Mammalia, 4,500 species of mammals still possess certain different features about their bodies, abilities to adapt to living environments, ... Each species of mammals have certain features for their survival, adapt and develop their race in the extremely harsh living habitats. Based on various characteristics of mammals, of which is the similarity in body structures and geneticity of mammals, classifications are as follows:

Subclass Prototheria (egg-laying mammals).

- Order Monotremata: Around 6 species, including echidna and platypus, living in the Australian continent.

Subclass Theria.

- Order Marsupialia: remaining around 242 species, mainly living in Australian continent, some species in South America and a species in North America.

- Order Insectivora: around 400 species of small-sized mammals like rat, mouse... living in various places, largest number in South America, but not in Australia.

- Order Chiroptera: around 875 species, living in all continents except polar areas.

- Order Dermoptera: only 02 species of flying lemurs with small-size body, living in Southeast Asia.

- Order Zdentata: around 31 species, only living in South America.

- Order Pholidota: 08 species of pangolins, only living in tropical areas of Africa and Southeast Asia.

- Order Rodentia: the largest in the class mammalia, with around 1,687 species ranging all over the globe.

- Order Lagomorpha; 63 species, living all over the earth except Australia (Rabbits that are seen in Australia now are brought by people).

- Order Cetacea: remaining around 84 species which have body structures adapted completely to watery habitats, impossible to live on ground.

- Order Pinnipedia: Around 30 species, range mainly in North and Southern poles.

- Order Carnivora: with around 254 species, wide range in the world, except Australia.

- Order Proboscidea: including 02 species of Asian elephants and African elephants, living in Southeast Asia, India and Africa, are the largest terrestrial animal.
- Order Sirenia: including 4 species that adapt completely to watery habitats, live in two separate areas: Indian Ocean and the Atlantic.
- Order Perissodactyla: around 16 species that have large hoof, live on botanic food.
- Order Artiodactyla: around 171 species that eat botanic food or omnivorous, wide range existing all over the continents except North pole and Australia (Artiodactyla mammals which are now seen in Australia are imported).
- Order Primates: around 166 species that include humans, eat tree, leaves or omnivorous, live in tropical and sub-tropical regions of Africa, Asia and Australia.

b. Ecological of mammals

Ecology is a scientific subject of study on correlations among biological species and between biology and living environments. Reviewing, assessing impacts of ecological factors on the survival and development of living organisms are responsibilities of biologists. Ecological factors are divided into 2 groups: Non-biological factors (non – living) and biological factors (alive). The same as other living organisms, mammals are affected by two groups of factors, of which each group has different role, importance and impacts.

c. Role of mammals toward the lives of human beings.

Relationship between human beings and animals in essence is completely for the sake of human beings. Mankind considers those useful species of mammals as friends and harmful mammals as foes, as well as pay inattention to species which are less useful or do bring back direct threat to them.

Today, mammals become an important resource of mankind. Man protects useful species and restricts damages by mammals, man has also domesticated successfully various wild species of mammals, converted them as farmed ones to be developed towards directly serving human beings (draught force, meat, milk, furs, skin, medicines,...).

Wild mammals is an important study subject of zoological researchers under different in various disciplines. Through this research, it has found the biological laws of mammals, thereby one can make proper decisions on operations, restorations as well as protection of mammals. Studies works on psychophysiological features and customs of mammals have contributed to formation and development process of man's consciousness. Various species of mammals have been being used as objects for experiments to study dangerous diseases in humans as well as better understand about laws of man's physiology.

d. Regional fauna of mammals in Vietnam.

In the system of reserved areas in Indochina - Malaysia of IUCN, Vietnam is considered as an area having rich composition of species and having high level of endemics against those of neighbouring countries in Indochina. According statistics, at present regional fauna of mammals in Vietnam include around 300 species (Institute of Ecology and Biological Resources, 2003). Of which, various species have high local diversifications, various endemic species are of scientific and economic value. Of the total 300 species of mammals which have been discovered, there are up to 78 species and subspecies of endemics (Le Trong Cuc, 2002).

For primates alone in the Sub-indochinese area which have 21 species, Vietnam alone possesses 15 species, of which 7 species and sub-species are endemics (Eudey, 1987). At present there have inventoried 23 species and sub-species, accounting up to 38 % species of **monkeys** announced in Asia, of these there are 2 species and 5 sub-species of endemics: *Rhinopithecus avunculus*, which are at present seen only in Na Hang (Tuyen Quang province) and some its neighbouring areas; *Nycticebus pygmaeus* and other sub-species of endemics: *Trachypithecus francoisi francoisi*; *Trachypithecus francoisi poliocephalus*; *Trachypithecus francoisi hatinhensis*; *Trachypithecus francoisi delacourii* and *Pygathrix nemaeus*.

Group Artiodactyla has important roles in nature and also in man's life. According to statistics, in Vietnam up to the moment it has known 23 species and sub-species under 5 families, of which two species have been extinct. Some important representatives of this group are *Bos sauveli*, *Bos banteng*, *Bubalus bubalis*, *Cervus eldi*, ...

Group Canivora in Vietnam tropical forest is rather rich in number. Up to the moment, there have found 39 species under 24 breeds, 6 families of which up to 16 species are classed as precious and endemic species. Representatives for this group are dog, tibetan bears, Malayan bear, tiger, lynx, panther, Masked Palm Civet, **Musk-cat**,...

Species of mammals highly significant for protection such as elephants, rhinoceros, *Bos sauveli*, *Bos banteng*, *Bos gaurus*, *Bubalus bubalis*, *Panthera tigris corbetti*, panther, *Cervus Nippon Pseudasis*, *Cervus eldi*, Loris, Gibbon, *Pygathrix*, *Trachypithecus phayrei*, **Vọc quàn đùi**, *Rhinopithecus avunculus*, ...

In Vietnam's marine environment, so far, the country has inventoried 16 species of sea mammals. Common seen are blue whale (*Balaenoptera musculus*), toothless whale (Baleen), **cá voi khoang**, some rare precious species such as *Dugong dugong* ... They are species that were originated from Pacific oceans, penetrate Eastern sea during winter migration in the north or flowing with sea's currents to catch fleas; beside that dolphins, *Neophon phocaenoides*,... in Ba Lat escentuary (to Red river), seas in central Vietnam, escentuaries of Me Kong and Con San islands.

e. Mammals potentials in Vietnam

In the world, Vietnam is where has not yet been studied in a systematic way. It is certain that various other species have not yet been discovered in Vietnam. In recent years alone (between 1992 and 1997), Vietnamese scientists in collaboration with WWF have found additional 03 species of large-sized mammals and 3 small-sized species: *Pseudoryx nghetinhensis*, *Megamuntiacus vuquangensis* in Ha Tinh; *Pseudonovibos spiralis* in Lam Dong; *Caninmutiacus truongsongensis* found in West Quang Nam, *Muntiacus puhoatensis*, Civet in the Central Highland (....).

In 2000, Institute of Ecology and Biological Resource have found a population of species *Lutra sumatrana* in the U Minh Thuong reserved area(Kien Giang), these species were thought to be extinct. Added up to the list are species of bat *Spearias blanfordi* – recently discovered. During 2001 - 2002 there also found subspecies *Pygathrix nemaeus cinereus* in Ba To (Quang Ngai province). Survey results in 1999 - 2000 in swampy and lime-stone mountain area of Van Long (Ninh Binh province) found a population of *Presbytis francoisi delacouri* with around 30 individuals including grown-up males, females and young. This has been so far the largest population of natural *Presbytis francoisi delacouri* in Vietnam.

f. Current status of mammals in Vietnam.

Due to various reasons, of which they include subjective reasons resulting from nature and objective ones caused by man, at present regional fauna of mammals is facing various threats and being seriously deteriorated.

Table 1. Development status shown by number of rare, precious species of animals, plants that are of value in Vietnam.

No.	Species	Survey period	
		Before 70's (individuals)	Data in 1999 (individuals)
1	Rhinoceros sondaicus	15 ~ 17	5 ~ 7
2	Elephants	1500~2000	100~150
3	Tigers	~ 1000	100~150
4	Bos sauveli	20~30	unclear
5	Bos gaurus	3000~4000	300~350
6	Bos banteng	2000~3000	150~200

2.3. Status of some rare precious species of animals in Vietnam:

Indochinese tiger (Panthera tigris Coberttii) is classed in the group I-B of the Decree 48/NĐ-CP, Annex I of CITES. Indochinese tiger range their distributions in

Vietnam, Lao, Cambodia and Thailand. At present, Indochinese tiger is facing two main dangers namely being hunted down and lost their livign habitats. Vietnamese tigers under sub-species *Panthera tigris corbettii*. Previously when natural forest covered 43% of the country's area, they range their distribution all over highland and forest areas. Information received from hunters and scientists showed that tiger's population is very much rich (Le Hien Hao, 1973), up to 1973 number of tigers killed annually had been no less than 300 units. At present, tiger's status in Vietnam is set at alarming level. Estimated number of tigers remained no more than 150 who are now living in separated and seriously deteriorated areas. According to statistics by Forest Protection Department in 2002, through consolidated reports from provincial division of forest control nation-wide, at present tigers in Vietnam range their distribution in narrow and divided habitats. Number of remaining tigers is around 150 individuals in provinces of Gia Lai, Kon Tum, Quang Nam, Lai Chau, Quang Tri and Quang Binh.

Asian elephants (*Elephas maximus*), situated in group I-B of the Decree 48/NĐ-CP, Annex I of CITES. it is a species of mammals that have large-sized heliotrope, have large range of distribution in 12 Asian countries India, Nepal, Bangladesh, Myanmar, Southern China, Thailand, Lao, Cambodia, Vietnam, Malaysia, Sumatura and Borneo island. In Vietnam, previously the number was.....At present, elephants survive into small groups of 3 - 5 individuals living in divided habitats in the provinces of Gia Lai, Dac Lak, Yok Don national park, Kon Tum, Quang Nam, Ha Tinh, Binh Thuan, Dong Nai. According to survey of Forest Protection Department, number of elephants that live in the wild is no more than 150 individuals. In recent years (2000-2003), conflicts between elephants and local people occured vigourously in the provinces of Binh Thuan, Quang Nam. It is because local people got to the forests collecting and picking forest products, encroaching forest land to use as agricultural lands leading food source and habitats for elephants become more and more reduced. In addition to wild elephants, local ethnic minority people in the Central Highlands have long had a custom to hunt, tame and domesticating wild elephants, at present the number of domesticated elephants is around 120 individuals. Domesticated elephants are used mainly for drawing timbers and tourism. Together with the scheme by the Government to close forests, to restricts exploitation of forest products, fostering and keeping domesticated elephants have become a great burden on local people.

Sao la (*Pseudorys nghetinhensis*). listed under group I-B of the Decree 48/NĐ-CP, Annex I of CITES, is a species of hoofed mammals that was recently found in Vietnam in 1994, in Vu Quang National Park, Ha Tinh province. they range their distrution in Lao and Vietnam, at the altitude between 200 and 700m on low mountains in northern strip of Truong Son trail, ranging along Vietnam - Lao border from Nghe An to Thua Thien Hue province. Sao La has body weight of over 100 kg, with a shiny black pair of horns which are 40 - 50 cm long and rather straight. Sao la has soft and smooth dark brown hairs, on their necks and faces there are blur white spots. Sao la is a plant eater, they can eat various types of forest leaves, especially those of taro tree family. Recently, in the watershed forest upstream of Huong river (highland district of A Luoi), local people have found a population of Sao La with around 25 individuals. Level of extinction danger to them is very high due to illegal hunt-down and loses of habitats.

Species of primates: primates in Vietnam are rather rich and diversified with 23 species and sub-species, accounting for 38% total of species remaining in Asia. Of which, there are various endemic species. *Rhinopithecus avunculus* now only exist a small population in Na Hang - Tuyen Quang and Ba Be national park and *Nycticebus pymaeus*. These two species are all listed under group I-B in the Decree 48/CP, annex I of CITES Convention with a small number of remaining individuals. According to estimate by scientist, the number of *Rhinopithecus avunculus* remain around 111-191 individuals (Institute of Ecology and Biological Resource, 1999). There are 5 sub-species of endemic monkeys *Trachypithecus francoisi francoisi*; *Trachypithecus poliocephalus* remain only around 60 - 80 individuals; *Trachypithecus francoisi hatingensis* have now around 300 individuals, *T.f. delacouri* now remain around 80-100 individuals and sub-species *Pygathrix nemaeus*. All these 5 sub-species are found only in lime-stone mountain areas in Phong Nha (Quang Binh), Moc Hoa, Tuyen Hoa (Tuyen Quang) and Vu Quang (Ha Tinh), Cat Ba national part (Hai Phong city).

Having the smallest size of all primates in Vietnam is loris with 2 species: large-sized loris (*Nycticebus coucang*) and small-sized loris all listed under group I-B specified in the Decree 48, these 2 species survive in a very small number in the wild.

In the regional fauna of primates in Vietnam, in addition to monkey and leave monkey, there are also species of gibbons (Hylobatidae) include 5 species: *Hylobates concolor concolor*, *H. c. gabriellae*, *H. c. leucogenys*, *H. c. hainamnus* and *H. lar*. Of which, *H. c. leucogenys*, *H. lar* and *H. c. gabriellae* listed under the group I-B specified in the Decree 48/NĐ-CP. Number of gibbon individuals remain low, *Hylobates concolor concolor* remain only around 350-400 individuals, *H. c. gabriellae* around 150-200 individuals, *H. c. leucogenys* around 350-400 individuals (Institute of Ecology and Biological Resource, 1999). *Hylobates lar* have limited range, only in Phu Quoc island with a limited numbers of individuals.

Bos gaurus, listed under group I-B of the Decree 48/NĐ-CP, Annex I of CITES. is a species of large hoofed mammals, large range of distribution in Vietnam, a mature individual can be 900 - 1.000kg in weight. ***Bos gaurus*** often live in herds of ten individuals in **Dry forest**, in areas of Ealoc, Yok Don national park, Easup district, Nam Nung (Dak Lak), Cat Tien national park (Dong Nai), Bu Gia, Ky Anh (Ha Tinh), Tan Ky (Nghe An), Ba Ren (Quang Binh), Cam Lo (Quang Tri), Sa Thay, Cong Ha Lung (Gia Lai), Muong Nhe (Lai Chau), Bao Loc (Lam Dong). Before the decade 70's, *Bos gaurus* had around 3,000 – 4,000 individuals, but in 1999 the number was just around 300 - 350 individuals.

Bos banteng: listed under group I-B of the Decree 48/NĐ-CP, Annex I of CITES. Their body is smaller than that of *Bos gaurus*, yellow hair, there are on their rumps spots of visible white hair. Mature individual can be 700 - 800 kg in weight. Their range of distribution areas are Central Highland forests. Their limit of wild distribution area is Hai Van pass. *Bos Banteng* has the ability to bear difficult weather, lengthly desertlike conditions. Previously, their number individuals were around 2000 - 3000 individuals (during years 70's), but at the present, the number of remaining *Bos Banteng* is very small between 140 and 200 individuals. The primitive cause that leads gradual decline to *Bos Gaurus* and *Bos Banteng* population is illegal shooting and hunting. Between 1991 and 1995, there were

around 415 individuals of *Bos Gaurus* and *Bos Banteng* being hunted down (Do Tuoc, 1997). Without having protective measures *Bos Banteng* will be in danger of extinction.

Bos sauvenlir: listed under group I-B of the Decree 48/NĐ-CP, Annex I of CITES. *Bos sauvenlir* is a species of large hoofed mammals, a mature male can be up to 900 kg in weight and up to 2 m in height. *Bos sauvenlir* is one of species newly discovered in 20th century. It was first found in 1937. *Bos sauvenlir* received great attention from scientists, because this is an important source of genetic cells to enable creating breeds of high-productivity cows. *Bos sauvenlir* ranges their distribution in 3 Indochinese countries. The number of these species that live in the wild is very small. According to scientists, during 1940's the number of this species was 1,000 individuals, by 1964 only around 500 individuals, by 1969 according to IUCN only around 100 individuals. In 1999, according to survey by scientists of Institute of Ecology and Biological Resource have not noted the presence of this species, however, it is estimated that the number of individuals in Vietnam remain very low and in danger of extinction.

One-horn Rhinoceros (*Rhinoceros sondaicus*) listed under group I-B of the Decree 48/NĐ-CP and Annex I of CITES. Together with the two-horn rhinoceros, *Rhinoceros sondaicus* is a representative of old world animals present on earth around 30 to 40 years. Their body is 2-4 m long, up to 3.6 ton in weight, thick skin and almost hairless. Due to over-poaching to dehorn for medicines, therefore two-horn rhinoceros are now extinct in the country. The last individual of two-horn rhinoceros poached in Cam Ranh - Khanh Hoa province in 1904. At present in Vietnam there remains only one-horn rhinoceros which are distributed in Cat Loc, Cat Tien national park. During 1970's, one-horn rhinoceros have between 15-17 individuals in Vietnam but up to now according to scientists, the number of one-horn rhinoceros remain only around 5-7 individuals. Danger of extinction for this species is set high as the remaining number of individuals is too small to possibly restore their population and continuing poaching for medicine.

Musk deer (*Moschus moschiferus*) listed under the group I-B of the Decree 48/NĐ-CP. Musk deer is an even-hoofed species of plant eaters. They have small body size, body is 0.8-1m long, 0.5 m high. Musk deer have musk glands located behind the navel, this is a type of precious aromatic spices used in the know-how to produce fragrance. In the decade of 70's, musk deers numbered between 2,500 and 3,000 individuals but there now remains only around 150-170 individuals scatteredly distributed in the Northern mountainous areas..

Deer *Cervus eldi* listed under group I-B specified in the Decree 48/NĐ-CP, Annex 1 of CITES, it has average body size. Previously Deer *Cervus eldi* were only noted in some areas of Vietnam. During 70's, they numbered might number between 700-1000 individuals but since 1986 there has been no records on this species. In 2002, foot-prints of Deer *Cervus eldi* were found in Chu Prong reserved areas. This was an important discovery to prove that Deer *Cervus eldi* has not yet been extinct however, the danger for poaching remain highly alerted. According to Le Trai (2000), Chu Prong is an ideal place for Deer *Cervus eldi* to live, however pressure by local people on reserved area is very high. According to survey by Institute of Ecology and Biological Resource in 1999, they numbered in the wild only between 60 and 80 individuals. Without efforts to preserve deer *Cervus eldi* will be

completely extinct from the earth as this species' population in Chu Prong is the last one.

Spotted linsang (*Prionodon pardicolor*) listed in the group I-B of Decree 48/NĐ-CP, Annex 1 of CITES is a species of mammals under the order carnivora, with small size, body weight of around 1 kg, they often range in green forest with creeper or stand-alone trees. In Vietnam Spotted linsangs were found in provinces of Ha Tinh, Thanh Hoa, Bac Giang, Bac Kan, Lang Son, Lao Cai, Quang Ninh, Tuyen Quang, Hoa Binh, Lam Dong, Gia Lai, Dak Lak and Tam Dao national park. This species is foe to rats that have an important role in ecological balance. Up to now, the number of this species living in the wild remain minimal due to poaching for furs, meat and illegal trafficking.

Tibetan bear (*Selenarctos thibetanus*) is a species of carnivore that is 100-200kg in weight, black back, in the necks appearing a V-shaped white hair edge. Tibetan bear live in watershed forest, sometimes seek food in different forest areas. Main diets are birds, bee's honey, chesnut, oak nuts, fig, banana, bamboo shoots,...In Vietnam, Tibetan bear have large range, they live from Northern mountainous areas to southern provinces of Tay Ninh, Dong Nai. Tibetan bear in Vietnam do not have phenomenon of hibernation. Current situation of illegal hunting down Tibetan bear for purpose of raising in captivity to exploit bear's feets, galls, or to cook bear bone glue for medicine is happening at alarming rate. According to scientists, the number of Tibetan bears that live in the wild is very small, on the contrary situation of fostering this type of Tibetan bears in captivity happens rather commonly, even though Tibetan bears are listed in the group I-B of the Decree 48/NĐ-CP, according to survey of Forest Protection Department, in the whole country there are thousands of Tibetan bears kept in captivity.

2.4. Database on Wild Animals in Vietnam

At present in Vietnam, the monitoring and management of wild animals is responsible by various agencies. For terrestrial animals, Ministry of Agriculture and Rural Development (MARD) is responsible for management of information related to enforcement of foresting laws, violations and offending status, illegal trafficking and transporting of wild animals (see Website <http://www.kiendlam.vn>). CITES office located at the Forest Protection Department have mandate to manage and supervise import and export of wild animals and wild animals-in-transit, especially species listed in the CITES annex. In addition, information related to raising, fostering and reproducing of wild animals also gets updated by MARD.

Ministry of Natural Resource and Environment (MONRE) manages data and information related to Wild Animals, alien species... (Website <http://www.nea.gov.vn>).

Ministry of Fisheries is responsible for controlling and management of data related aquatic species, fishes and fishing. Data related to catching, operation and export of aquatic products. Diversification of fishes and marine invertebrate species (Website <http://mof.gov.vn>).

Scientific research institutions such as Institute of Ecology and Biological Resource, universities and colleges: College of Forestry, College of Natural Sciences, Institute of Forest Survey and Planning conduct research studies on wild animals. These

institutions possess data related to biology, populations and preservation status of wild animals.

Non-governmental Organisations (NGO's) work in the domain of animal preservation: WWF, IUCN, Birdlife, FFI, in collaborations with national and international scientists who conduct various projects of animal preservation, investigation, supervision possess certain data related to certain species of animals,

Wild Preservation Area, National Parks with support from research institutions and scientists possess data on wild animals in their control areas.

2.5. Role of wild animals in the wild and man's life

Around 3 millions years back, most primitive man belonging to Homo breeds came to being. Undergoing a long period of struggling for survivals with severe natural conditions, from primitive man there appeared a new specie who was very intelligent mankind (*Homo sapiens sapiens*) around 200,000 years ago. Since his appearance, man knew how to use, control the world in general and animals in particular to serve for his own life. In general, there are many ways to evaluate role of animals depending objectives of evaluation. With different objectives, one specie is useful with one objective, while it is harmful when consider it under other objectives. Relationships between man and animals are considered completely on the basis of man's sake. Generally, for the sake of man, animals have the following roles:

a) Positive role of animals

With their biological diversification and riches, animal can be used by man for the following objectives:

Preservation value: Wild animals have important roles in the balancing of ecosystem where they live thereby ecosystems become sustainable, progresses following natural routes. They form a link in a food chain and network. They formed extremely important values of preservation, these values are not only significant for the time being but also have potentials to be used later. Endemic species of animals contain sources of genetic cells for the whole world. Various endemic species of animals have genetic cells that contain good features that other species do not. Through wild species, man can conduct study, research, operations and usage suitably these cells so that it brings back effectiveness and efficiency. According to assessments of scientists, regional fauna of Vietnamese animals have rather high endemism than those of Indochinese countries: There are up to 15 species of animals in Vietnam of the total 21 species of primates in Indochinese region; regional fauna of birds have up to 10.17% of endemic species and sub-species and have up to 3 important endemic bird centers of the world.

Economic Value: Animals have important economic significance toward man's

life. Economic value of animals focuses on following contents:

Food source: since man came to being on earth, immediate food sources are natural products from hunting and poaching and hand-picking. Various species of animals are used for their diets in daily lives. Various species of animals are used by man for taming, domesticating, fostering certain species through many generations which later become breeds of livestock, poultry to serve themselves. One can say that animals' protein source is indispensable to man. Up to now, there still remains a number of local communities basing their lives on hunting products to survive.

Material for industry: various groups of animals supplying materials for different industries: species of mammals and reptiles supplying furs and skins; insects supplying honey or wax (bees), lags, silks (silk worm); some species of mollusks providing various precious products: pearls, ...

Medicine: Various products from animals are used by man for purpose of medicine (bee honey, fish liver, bear's galls, snake's venoms, rhinoceros's horns, ...). Various biological finished products are extracted from raising and fostering animal's tissues or live animals (vaccines, hormones...).

Pet keeping, serving for man's life and entertainment: a large number of animals are traded in the market or trapped for purpose of pet keeping. Especially such species of birds as parrots, hill myna, mynah or prey-searching birds. Many zoos and national parks display them for purpose of sightseeing and tourism.

In the cycle of materials: Biological cycles in nature have in full three phases – three links of a chain that have equivalent roles. In the first phase - production, plants synthtise complex organic substances from air, water and mineral salts. In the second phase - consumption, including other species of living organisms to conduct, of which mainly are different species of animals (plant eaters, carnivores, decayed organic substance eaters, ... The third phase is to reproduce energy supplied for living cycles, mainly for bacteria **disintegrating** complex organic substances which originate from the first and second phase forming simple inorganic substances. From these simple substances, plants can easily absorb to once again create complex organic substances and continue the same cycle of such material circulation. Therefore, it is easy to recognise that animals play an important role, are a "chain link" indispensable to the cycle of natural material circulation, in which man is the most advanced element of that "chain link ".

Used for Scientific Studies and Education: This is a important role by animals to man. Through animals, especially species closer relative to humans, man can conduct scientific studies for serving better and better their lives. Man have learned a lots of things from animals: successfull manufacture of aeroplanes when observing, learning from birds; producing various types of medicine based on tests

and experiments on bodies of animals whose body compositions are rather similar to those of humans, ...

b) Harmful roles of animals.

Besides positive aspects, animals also have harmful aspects toward humans.

Various species of animals are direct or indirect causes to some dangerous diseases to human: bubonic epidemics transmitting rats; Anopheles mosquitoes transmitting malaria; parasite worms in human body; some species of bats transmitting viruses; amoeba causing gynaecological diseases, ...

Harming, damaging food, crops, storages, construction works of human: rats, insects devastating crops, plants, especially food trees and forest trees.

2.6. Main dangers and potentials for forest animals

As mentioned above, all causes that threaten biological diversifications are also causes endangering wild animals. Below are major threat to wild animal:

2.6.1. Loses of habitats

Illegal wood cutting, exploitation of forest products, construction of infrastructures and agricultural farming are main reasons to cause loses of habitats for wild animal specie. Previous forest cover area (1943) occupied over 43% area of the country, at present the forest area is reduced to account for 30%. New forestation on many forest areas could not restore habitats for wild animals, due to lack of indigenous varieties of plants. Lost and divided habitats, new roads are constructed dividing forests, imposing hindrances to prey-search trips as well as opportunities to copulate for animals. Besides that, forest fire and encroachment by strange species of living organisms have also led to wild animals. The forest fire in 2002 ở U Minh Thuong national park damaged to nearly 4,000 hectar of forests where are home to various species of aquatic animals and reptiles, amphibia. At the Tram Chim national park, at present a strange plants known locally as “Mai duong”, have encroached thousand hectares of gardens affecting on food source to migratory crane - *Grus antigol*.

2.6.2 Illegal poaching and hunting

Poaching and collecting wild lives are also important causes that lead to extinction, poaching and hunting down on wild lives existed since thousands of years ago, but for recent decades, poaching and hunting have exceeded sustainable thresholds. Paces for restorations of wild life populations are not quick enough to match with poaching. Previously, local people went poaching and hunting all year round, especially during reproduction seasons therefore a lot female individuals were caught, poached, abilities to restore is declined. Due to impacts from demand of wild animals in market, especially for exporting, pressures on poaching wild animals in natural reserve areas and national parks are increasing more and more, although the Government have taken measures to strengthen management of wild life animals.

2.6.3. Illegal trafficking of animals cross-borders:

Vietnam with long borderlines and which borders Lao, Cambodia in the West, and China in the North. While natural resource of wild animals in the country is declined more and more together with policies to protect wild animals by the state, some organisations, individuals turn to trade these animals to neighbouring countries. Wild animals are transported into Vietnam through different channels. Through Airway, this is done by way of transshipping. Wild animals exploited from other countries will be then transhipped in Vietnam and exported to third world countries. There appeared forms of trade fraud in crossborder transactions of wild animals, such as using permits, fake export certificates by competent CITES in foreign countries to temporarily import and re-export, transitting samples of wild animals through Vietnam territory...

Therefore, capacity building for customs officers and border troops in fighting fraud and illegal trading wild animals is very important, especially for skills to identifying wild animals that are commonly traded.

2.6.4 Awareness in the issues of wild animal preservation

Preservation is not a new concept in Vietnam. Recognising the importance of preservation as well as maintaining and using of natural resources, in 1959, President Ho Chi Minh launched “tree planting” campaign. On 21 June, 1960, the Prime Minister issued the Directive No.134/TTg regarding ban on elephant poaching; then Decree 39/CP dated 5 April, 1963 by the Council of Ministers issuing Temporary regulations on poaching and hunting bird and forest mammals and Decree on forest protection issued in 1972.

Facing increasing challenges in the preservation of nature as well as environment management, Vietnamese government offered great efforts which are shown in number of proposals since 1985. National Preservation Strategy (1985) although have not yet been passed, have signaled a increase awareness on the important role of perfecting management of natural resources aiming at development. Especially, in this strategy, issue of training, education, raising awareness for communities have been paid a proper attention, and considered as one of effective tools aiming at preserving and using on a sustainable basis natural resources.

However, before 1990’s, because the economy was under-developed, leaders directed their attention to economic growth. The exploitation of natural resources was only to serve consumption but also export. Sometimes, implementation of economic objective driven schemes did not base on scientific basis, masterplans, which caused abuse, over-exploitation causing decline of living resources.

Besides policies which showed Government’s care to preservations, awareness by people on issues of preservation and development of wild animals is yet high. For people living in localities with wild animals, for many generations the poaching wild animals have been considered as a job, they do not have much knowledge on preservation. They do not know why wild life resource are declining. Therefore, awareness raising for local people have a very important role, thereby pressure on forest will be reduced.

For businessmen: they do not at all have any concept about preservation of wild animals, for high profit they do not pay any attention to stopping business. They even know they are violating the law when involved trade in wild animals.

In recent years, activities of wild-animal trade in the country have been in complex process. This is one of important causes that leads to declination of living resources. Efforts spared by the Vietnamese Government and by various international institutions have help publics, policy-makers and desion-makers to recognise the role of preservation and control of wild animal trade. However, this recognition is yet profound, especially activities of propaganda and awareness campaign have not yet been strong, yet ended up in concrete actions, therefore result of control trading of wild animals have been very much limited.

2.6.5 Illegal trafficking

Together with campaigns to raise, foster and develop, trading of wild animals have been happening in complex process, with a lot of sophisticated tricks. Illegal traffickers used secrete routes and modern transportation as well as communications aiming at coping with competent authorities. Many traffickers use fake papers, wrong declation on species, number of wild animals aiming at cheating competent authorities. Trafficked species such as mainly: snake, tortoise of all kinds, pangolins, bears, species of monkeys, species of frogs, brids (most are alive and fresh). Wild animals in the country are mainly supplied restaurants especially in two major cities Ha Noi and Ho Chi Minh. Meat of wild forest animals is a favourite dish. Profit from illegal business of this type is rather large (superprofit after drug and arm trafficking). Causes of the trafficking are as follows:

- Penalties against violations in this area are still low,
- Forces to enforce laws in management of wild animals are thin, technical skills and qualifications remain weak and poor equipment provided.
- Market demand of wild animals is very high, especially in Chinese market.
- Awareness by businessmen and communities on the preservation issue remain low.
- Poor attention to widespread awareness campaigns and properganda on system of legal documents to manage, preserve and develop natural resources.
- Entitlement regimes for law enforcement forces have yet been satisfactory;
- Enforcement forces have not yet got real power, equipment for work performance is insufficient and backward. There remain overlaps with regards to mandates, functions and responsibilities among executive agencies.

According to incomplete reports by Provincial Divisions of Forest Control in 2001 there occured in the whole country 59,379 violations to forest laws of which 1,551 violations related to illegal trafficking and transporting wild animals. In 2002 there happened a total of 43,496 violation cases against forestry law, of which there were 1,028 cases of illegal trading and transporting wild animals (IT database – Forest Protection Department).

Trading of animals: in the total of over 252 species of animals, there have been up to 147 species are objects to be poached, hunted down and traded, but in the market there have recorded only 55 species of animals. They were mainly traded previously food consumption to local people. In recent years, mammals are traded a lot in market, most forest animal's meats are supplied to restaurants to satisfy urban dwellers's favourite diets and export. Besides meats, forest mammals are also traded

for purpose of pet keeping, situation of keeping these animals in captivity happens commonly. Species that are commonly kept in captivity: primates, panther, bear, some species of civets, weasels. In addition to trading, poaching and hunting down for purpose of traditional medicine are also happening regularly. Bear's gall, rhinoceros's horns, monkey bone glue, tiger bone glue ...are still considered as traditional remedies to cure various diseases. At present, there are thousands of galls traded, kept in captivity for extracting gall. For the past 2 (2000-2003) there were 4 trafficking cases of tigers and tiger-based products to be discovered by Forest Control teams. **Trading avian species:** trading avian species in Vietnam is to mainly satisfy pet keeping and diet demands. At present, it is difficult to control this market, in rural village markets where it is common to see birds of various kinds on sale: lonchura, rice field sparrow, various tipes of swallows for cuisines. In large markets Ha Noi and Ho Chi Minh, where avian species are displayed on sale for purpose of pet keeping and collection for export. Avian species exported are mainly white head laughing-thrushes, yellow-throat white eys, Chinese laughing-thrush, red munia, red-whikered bulbul...According to survety by CRES and TRAFFIC, in some bordergate areas of Lang Son found white-pheasant chicken (*Lophura nycthemera*) and **khướu đầu trắng**.

Situation of trading and trafficking avian species that have wild origin is set at alarming rate, without managing this would lead to serious declination of bird population in the wild. According to survey of CRES in 1993 in Red river delta there are up to 14,883 birds under 22 species traded for diet and export. In Ho Chí Minh there are up to 44 species of birds traded and transported, estimated 5,100 migratory birds traded each day.

Trading reptile species: reptiles are traded in market for various different purposes: for food, medicine, pet keeping and skin-hide products.

Species that are used for food: crocodiles, snakes of various kinds, *Leiolepis guttata*, iguana, pond turtles and tortoise. Species that are used for medicine: Gecko, cobra, *Bugarus fasciatus* Schneider1801, colubers, boa bone glue, boa fats, tortoise shells...Species that traded for pet keeping: tortoise, hawksbill turtle (*Eretmochelis imbricata*), Green turtle (*Chelonia myda*), boa...

In Vietnam, reptiles are trapped and collected a lot in provinces of Me Kong river delta and central Vietnam, then transported to large cities for consumption and export. Of all species of wild animals traded in market, reptiles account for the largest share. Due to their biological features, they can survive for a period of time without being fed, in addition they are able to stand all transport conditions.

Trading amphibian species: Amphibian species are regularly most traded in Vietnamese market are toads, Microhylidae, *Rana rugulosa* Wiegmann,1835 ...These species are traded to mainly meet food demands. In recent years, besides pressures from local market, some amphibian species are also exported to European and American markets in forms of frozen foods. Some species of toads are used as traditional medicine.

Main routes for trading wild animals: Vietnam is a place supplying wild animals for domestic consumption and demand from foreign countries. However, local wild animal resource become scarer and scarer due to over exploitation, poaching and because the Government have not had strong measures aiming at controlling,

preserving wild animals. Vietnam is also a interchange point for wild animals from South East Asian Countries to others. Wild animals are exploited massively in the country, especially in central and central highland provinces. Wild animals consumed locally in large cities Ha Noi and Ho Chi Minh. Provinces of Quang Tri, Thua Thien Hue, Quang Nam, Ha Tinh, Nghe An, Gia Lai, Kon Tum may be a large source of wild animals for exploitation. Provinces sharing border with Lao and Cambodia are where wild animals are imported and aggregated to transport to HCM or Ha Noi, by refrigerated lorries, rallying in the Northern border provinces and transit animals to the third countries. Highway No. 1 is largest transportation route for wild animals. Wild animals in addition are transported in a small volume in a very secret and sophisticated way, by special-use vehicles, train or airway.

2.6.6 Wild animals in captivity

Keeping in captivity wild animals, poaching and hunting down wild animals are not only serving for purpose of diets, jewelry, and dead specimen for display. Some large-sized wild animals are hunted and traded for purpose of keeping in captivity:

In Vietnam, keeping wild animals in captivity for the following objectives:

- To collect animals into a large amount to create goods to be traded in the market (tortoise, mangolin, snakes....)
- Aiming at exploiting some products from animals (stag's ivory, bear's gall, furs...)
- Serving for sight seeing, entertainments, pet keeping and circus performance (bear, monkey, elephants..)
- Aiming at raising, fostering and reproducing products to be sold in market (boa, snake, pond turtles, crocodiles, spotted deer..)

Information from Forest Protection Department show that in 2003 the number of wild animals kept in captivity in 23 provinces and cities went up to 1,400,624 individuals including various different species: *Leptotilos javanicus*, **Nhang Sen**, teal(*Anas crecca*), pelican, wild goose, wild duck, *Prionodon pardicolor*, *Arctictis binturong*, *Neofelis nebulosa*, *Panthera pardus*, *Bos banteng*, *Bubalus bubalis*, Deer, *Cervus Nippon Pseudasis*, *Pavo muticus*, hedgehodge, **Trích**, tigers, crocodile, gibbon....

Therefore, with such a large number of animals kept in captivity, in which there are many rare species, as the one of important causes threatening wild animals. Moreover, demand for keeping wild animals in captivity is still high even though the State has issued various legal documentations to ban keeping in captivity wild animals. Besides some rescue centers, zoos, almost captivity of wild animals have been spontaneous and illegitimate. The captivity of wild animals has not only increase pressures to exploit wild animals from the wild, moreover if releasing captured animals back to the wild, they will lose ability to seek preys themselves and easily get caught. Other issue is that origin of captured animals is unclear, the selection of suitable habitats to re-set them free to the wild is a difficult job, selected habitats must ensure sufficient food source, predators - preys and habitats for them not to cause imbalance of ecosystems to where they are released and for themselves not to be killed.

Chapter III. Wild life management and preservation

3.1 Agencies responsible for wild life management

In former times, wild animals were used by local people without being interfered by market, demands, price, and supply factors. For the time being, wild animals become great demanded commodity on market. That's why, it is fully covered by characteristics and features as a commodity and under management of numerous law enforcement agencies, not only forest protection but as well other forces.

At any forests, forest owners are responsible for protection, while forest protection agency on one hand consulting local authority to issue legal papers adjusting wild animals protection actions and on the other hand, with a total number of about 9 thousands forest rangers on nation wide, acting as a driving force on forest management, protection and wild animals protection. Once wild animals become commodity, police and market management forces take over supervision actions meanwhile it is customs' duties to supervise import-export of wild life.

3.1.1 Forest protection force

Forest protection force is set up in accordance to Ordinance on forest protection (1972). Since 1991, the State stipulated Law on forest protection and development with a separate Chapter (chapter VII) regulating forest protection force. Nowadays, forest protection force is organized in conformity with Decree Nr.39CP on 18/5/1994 of the Government on organizational structure, tasks, and authority of forest protection force as:

- Forest protection is a specialized force with forest management and protection functions,

- It is systematically organized: At Central level: Forest protection department (FPD) is under MARD; at provincial level: Forest protection sub-department (FPsd) is attached to provincial People's Committee while at district level, forest protection section belongs to FPsd and under instruction, supervision of district People's Committee. District forest protection section organizes forest protection stations at commune with forest and dispatches forest rangers to work directly at communal level. At the moment, 4,500 forest rangers are working at commune to undertake forest protection, management, to educate and disseminate people to protect and enforce forest law. FPsd also organizes mobile forest ranger groups, forest products check-up stations at important traffic conjunctions to control forest products transportation, circulation including wild circulation and trading of animals and plants.

- While undertaking law on forest management and protection, forest rangers within their entrusted power, are entitled to arrest and deal with illegal cases on forest management, protection and forest products trading, circulation.

Particularly, forest protection force directly management forest, prevent forest destruction, cutting and control wild animals hunting. Forest protection force is based at forest gates.

- Functions, tasks, authority and organizational structure of forest protection force are regulated by Minister on Agriculture and Rural Development under the Decision

Nr. 92/2003/QĐ-BNN on 04/9/2003. Article 1 regulating: FPD is MARD's agency to undertake state management function on forest resources protection, law enforcement on forest management, protection and forest products management in the whole country.

3.1.2. Department of Aquaculture resources protection

Department on Aquaculture resources protection was set up according to Decision Nr. 130/CT dated 20/4/1991 of the Ministerial Council (now called as Government). Under Ministry of Fisheries, this specialized agency exercises state management functions on aquaculture resources protection, fishing boats registration and at the same time to undertake specific activities within Ministry's responsible authority, on aquaculture resources protection, fishing boats and technical security of facilities and equipments in accordance with existing regulations. Department of aquaculture resources protection participate and coordinate with other departments, agencies inside and outside Ministry of Fisheries to undertake number of functions related to protection and control of wild animal trading as follows:

- Special inspection on aquaculture resources protection and development
- Grant and revoke operation license on aquaculture raising, exploitation, processing, services, aquaculture resources protection and development, protection of aquaculture creature environment
- Check quality and hygiene of fisheries foodstuff and environment, veterinary activities for aquaculture animals and plants, grant quality license to fisheries commodities.
- Instruct fisheries extension activities
- Manage national fisheries breeding system, manage fisheries breeds import-export
- Register and control technical security of fishing means, facilities.

Department of aquaculture resources protection also takes over the following task related to wild animals trading control as:

- Prevent and settle consistent with law on aquaculture resources protection, particularly at crucial water zone and rare, precious fisheries resources;
- Develop regulations and technical standards on aquaculture resources protection;
- Settle conflicts on aquaculture resources protection and living habitat of various aquaculture species

3.1.3. Customs

Vietnam Customs was set up rather early, since 1945 to "collect import-export tariff; collect indirect taxes, etc.". On 29/6/2001, National Assembly of the Socialist Republic of Vietnam adopted Law on Customs. Since then, the Customs' functions, tasks have witnessed lot of radical changes, shifting from purpose of "foreign trade control" into "serving foreign trade, international and cooperation, participation in

regional and world-wide economic integration ". At border gates, customs is the key force to prevent, fight against and control the transport of wild life through borders.

3.1.4. Market management organization

Department of market management is a specialized management department under Ministry of Trade. This department is assigned to prevent smuggling, commercial cheating and anti-fake commodities.

In coordination with other agencies under Ministry of Trade, Department of market management exercise state management functions over commercial activities as: import-export, commercial services, inputs services, domestic commodities of various economic sectors. Among these functions, there exists those related to control of wild animals, plants trading as:

- Grant license on commercial business and services operation
- Commodities quality management
- Market management, inclusive of wild animal.

3.1.5. Police force

Police force engaged in wild animals and plants trading is mainly economic police. Functioning as a law enforcement agency, economic police undertake different measures to fight against and prevent crime on economic management.

Within police force, there are also specialized police in some other sectors and they also involve in wild animals and plants trading control as: Communication police, economic police, Interpol, etc. Of which, participation from communication police is very important for control of wild animals, plants during transportation period, Interpol's participation also has critical position in fighting against criminal on wild animals, plants trading.

Apart from cited agencies, there are also number of other agencies involve in wild animals trading control as: Border army, plants and animals quarantine agencies, particularly Interpol, who play an important role to prevent commercial cheating and international smuggling.

3.2. International convention on wild life preservation:

3.2.1. Bio-diversity Convention

Bio-diversity convention was key result of the summit conference on Environment held in Rio de Janeiro in 1992. The Government of Vietnam signed this convention on 16/11/1994 and ratified action plan on bio-diversity in December 1995 to support to the implementation of this Convention in Vietnam.

Objectives of bio-diversity convention:

- Bio-diversity preservation;
- Use parts of bio-diversity (ecological system, species and gene source) without creating any harms in terms of both quantity and quality (sustainable use);
- Equal sharing of benefit generated from gene sources use.

Convention emphasises importance on preservation of natural area provided with other support activities to preservation outside natural preservation area. Convention deals with demands on identification and monitor important bio-diversity composition, setting up and maintaining typical nature preservation areas, sustainable management of ecological resources both inside and outside preservation areas; rehabilitating degraded ecological system, animals at danger; controlling exotic species and insects; preventing direct and underlying causes to bio-diversity loss and meeting demand on research, science and training.

Implementation in Vietnam: Bio-diversity convention is managed and supervised by Ministry of Natural Resources and Environment. However, forest protection and forest development departments under MARD take over the part on forest management in the Convention.

3.2.2. Ramsar Convention on wet land

Ramsar convention is on important wet land area, initially focusing on preservation and wise use of wet land areas as landscape for important water birds. This focal point is getting wider and currently wet land is clearly identified as a very important ecological system for bio-diversity preservation in general and human's existence in particular. Ramsar convention has been implemented since 1975 and up to 4/4/2002, there have been 131 members participating in this Convention and protection of 1,150 wet land areas. This convention is supplemented by a Protocol signed in Paris in 1982.

Vietnam entered this Convention since 20/9/1988 and already set up Xuan Thuy National Park, which was integrated into "list of wet land areas of international importance".

Implementation in Vietnam: Ramsar convention and wet land areas currently managed, monitored by Ministry of Natural resources and Environment. However, MARD takes over responsibility on forest management within wet land areas.

3.2.3. CITES Convention

CITES convention completed on 3/3/1973 in Washington with 13 initial members and

took effect since 1975. Currently, there are 164 countries participating in this convention. To meet international demands on importance of wild life and Vietnam's role on wild animals and plants trading in Indochina, Vietnam entered Convention on international trade of endangered species (CITES) and became official members (nr. 121) on 20th January 01, 1994. This convention is seen as a tool to support prevention of illegal international trade and unsustainable use of wild animals and plants. Once acknowledging that "...each State is the best protector of wild animals and plants in his country", CITES convention shall help accelerate international cooperation within international framework. Vietnam fully participate in Conference of country members held every 2 years to decide main issues on convention implementation. (decision made based on majority of vote) and maintain regular contact with Secretary Committee of CITES as well as other country members.

Vietnam's participation into CITES convention and its efforts made over the last years has contributed to eliminate illegal trade of wild plants and animals and at the same time to raise awareness of Vietnamese people on species preservation, particularly rare and precious ones. Actions related to wild animals trade, hunting, killing and use as foodstuff are strongly criticized although there is few prevention actions due to the lack of appropriate legal papers. Number of organisations, individuals strictly follow regulations stated in CITES on raising wild species have gained high benefit from exported products.

Illegal and unsustainable trade of wild animals is seen as the biggest endanger to existence of rare and endangered plants and animals in Indochina. Wild animals originated from inside country as well as neighboring countries is more and more consumed in Vietnam due to income increment of urban citizens. In addition to that, majority of wild animals are illegally exported to international market.

Once becoming CITES member, the implementation and follow CITES' provisions seems challenging to many countries. This is entirely true to developing countries as they lack of resources on technicians, equipments and facilities. Vietnam is not an exception. Since entering CITES in 1994, Vietnam has tried his best to efficiently follow commitment to CITES. Vietnam lacks of trained officers, facilities provided with limited knowledge and interest of different citizens ranks on bio-diversity preservation. It also lacks of cooperation between relevant agencies at national and international wide. Now the Government has promulgated legal papers regulating implementation of CITES. A CITES' specialized office is based at forest protection department. Additionally, there are more and more training course on CITES targeted at staff from this department and relevant agencies. Nevertheless, these efforts are not uniform and it is needed to have a comprehensive and strategic approach to conduct the implementation of CITES convention so as to effectively control wild animals trading inside country.

Implementation in Vietnam: The Government entrusted MARD to as CITES' management agency in Vietnam with CITES' office based under forest protection department. MARD is preparing to set up CITES' office in Ho Chi Minh City to instruct animals raising and at the meanwhile to monitor enterprise' performance in conformity with CITES' regulations. Two scientific competent agencies entrusted to take over scientific management are Institute on ecology and creature resources under National Center on natural science and technology and Research Center on natural resources and environment under Hanoi National University.

3.2.4. World Heritage Convention

World Heritage Convention aims to identify and establish mechanism to preserve world cultural and natural heritages by listing all preservation areas of great importance and outstanding values to human being. Convention wants to avoid degradation of preservation areas by setting close cooperation among country members. UNESCO adopted this convention in 1972 and currently there are 150 country members.

All country members commit to preserve preservation areas within their territories once being recognized as world heritage. Preservation responsibility is considered as share duty in international community. Vietnam entered this convention on 19/10/1987. Ha Long Bay is one of the first Vietnamese world heritage recognized in 1994.

Implementation: People's Committee of Quang Ninh province set up management board of Ha Long Bay, comprising 175 staff. Ministry of Culture, Information and the National UNESCO committee guide performance of the management board. Management board is responsible for management and protection of this heritage's value and natural resources use. Management board is sufficiently empowered to operate and manage the bay, including coordination and cooperation with MARD on management of Cat Ba national park.

3.3. Legal papers related to wild animals preservation

Recognizing importance and role and wild animals in particular and bio-diversity in general, the State has promulgated number of legal papers guiding adjustment social relations in this aspect (*see annex IV*). However, during implementation process, there exist lots of gaps and obstacles leading to loose settlement of administrative violence on wild animal management and preservation. Sometimes, existing sanction levels are not strong enough to warn, educate law breakers. That's why the revision of legal papers has significant meaning to uproot these conflicts.

3.4. Sanction measures applicable to wild animals hunting, transportation and trade:

Every action breaks regulation on wild animals management and protection have to be strictly dealt with, everyone has the right and obligations to live and work in

conformity with law. It is up to severity, organisations, individuals can be dealt with in accordance with Ordinance on sanction against administrative violence or Criminal code:

According to Ordinance on sanction against administrative violence nr. 44/2002/PL-UBTV10 of the National Assembly' Standing Committee – on 2/7/2002, it comprises the following levels:

- Warning level is applicable to organizations, individuals who break regulation for the first time with low severity.
- Fining from 5,000 to 500,000,000 vnd, of which article 14, provision 2 regulates maximum fining applicable to action breaking forest, forest products management and protection up to 30,000,000vnd. Violence on aquaculture exploitation may be fined up to 50,000,000 vnd.
- Revoking license use right, operational license.
- Confiscating materials, facilities used to break regulation.
- Being forced to rehabilitate status of environment pollution, diseases outbreak caused by that law breaking action.
- Being forced to transport or re-export illegal commodities, facilities out of Vietnam.
- Apart from these cited measures, it is up to different cases, other measures may be applied as in-spot education, etc.

Article 35 of Ordinance on sanction against administrative violence nr. 44 clearly regulates fining authority of forest protection force, of which forest rangers have right to fine up to 100,000đ, head of forest protection station is entitled to fine up to 2 million vnd, head of station can fine up to 10 million vnd, director of forest protection sub-department is empowered to fine up to 20 million vnd, director of forest protection department can apply maximum fining level in the field of forest and forest production protection. Besides, it is up to forest protection authority level, they can also confiscate means, facilities used to break regulation, force to rehabilitate original status, revoke license, operational license.

Those who have actions of serious violations, repeatitious breaches or serious damages to forest resources via hunting, proaching, trading and utilizing precious wild life shall be taken criminal proceedings.

Criminal Code of the Socialist Republic of Vietnam regulates at Article 190 as follows:

Anybody hunts, kills, transports, illegally trade rare, precious wild animals that prohibited according to Government's regulations or illegally transport, trade products made out of these animals shall be fined from 5 to 10 million vnd, educated without being kept in prison up to 2 years or kept in prison from 6 months to 3 years. Apart from that, if case of purposely committing crime, abusing entrusted power, using hunting equipments in restricted areas that leads to serious consequence, that person may be kept up to 7 years in prison. Furthermore, article 175, 176, 189 and 191 related to crime on forest destruction, forest management, exploitation and protection, particularly cases of breaking regulations on nature

preservation area, criminal may be kept up to 10 years in prison.

3.5. Several models on effective wild animals management and preservation

Wild animals reproduction models: This model is very effective for some kinds of animals, particularly amphibian and reptiles species as they have reproductive capacity under cages breeding conditions. Annually, wild animal reproductive units can generate a large quantity of alive animals and gain big profit. Part of the generated profit can be reinvested in preservation while a certain number of wild animals shall be released into wild environment. In Vietnam (particularly in Mekong delta area), reproductive models have gained certain achievements, particularly for some species as earth python, yellow python, crocodile and other small amphibian and reptiles. In practices, these species are very rare in nature, however, annual productivity may be up to hundreds thousand heads. That's why, it is necessary to conduct studies to release some kind of animals into nature. Practically, wild animals raising in Vietnam is mainly for business purpose and conducted by private companies or individual people. Scientific and preservation studies of these wild animals have not yet been conducted. Currently, MARD is developing an Action plan on wild animals and plants management and preservation in Vietnam. It is hoped that there will be number of programs to be implemented in order to conserve wild animals after endorsement of this action plan.

Models on raising of semi-wild animals: This model is applied by some countries. After being rescued, animals often raised in semi-wild conditions on large natural forest area but restricted by fence. In China, this model is rather successfully applied to some kinds of animals as bear. In common cage raising, bear has no reproductive capacity but in semi-wild conditions, it can reproduce. Furthermore, in semi-wild environment, animals are not entirely depended on fodder provided by human. It is therefore a very good transition step to release wild animals into nature. However, this model is rather costly and requires intensive and professional studies.

In situ preservation model: The best way for wild animals preservation is to leave them freely live in their environment where they have been adapted for thousand years and selected to exist in that environment. In situ preservation is a very economical and scientific model as it can make the best use of existing natural conditions. Animals takes the best advantages of ecology, biology and traditional custom of their species. The protection of natural scenery, preventing wild animals and their preys shall create favorable conditions for quick rehabilitation of the whole community. In Vietnam, preservation area system was set up, this is the existing natural forest where residing number of wild animals. Management board is set up under each preservation area to carry out lots of activities as: patrol, protection, scientific research, indigenous trees plantation etc. so as help preserve wild animals community in a better way.

Besides, preservation area management still faces up with lots of difficulties. Preservation area is small, narrow, dissected resulting in fragmented animal community. Limited financial sources can be seen as next difficulty as the available financial source is just enough to cover operational cost of management board and programs on preservation, scientific research and demarcation marking are rarely undertaken. Limited quantity and quality of staff engaged in scientific research in preservation are can be seen as another obstacle. Excluding some national parks, majority of preservation areas have no specialized staff for research aspect. Very

few preservation areas can carry out wild animals monitoring and evaluation program.

3.6. Procedures on raising and transporting wild animals

Wild animals raising and reproducing: raising, developing wild animals is always encouraged and facilitated by the State. This is clearly reflected via number of legal papers as: Decree 18/HĐBT of Ministerial Council, Instruction 359/TTg of the Prime Minister on 29/5/1996, Circular No. 62 of MARD, Decree No.. 11/2002/NĐ-CP of Government on management of activities related to import-export and transit of wild plants and animals.

Regarding common wild animals, it shall have to obtain permission from FPsd for registration of wild animal raising. In order to register, the following conditions must be met:

- To have legal breed source (at the moment, it is entirely prohibited to exploit wild animals as: insects, amphibian, reptile, birds and other species from nature). Breed sources can be originated from legally registered animals raising stations, legal import or confiscated and handed over by responsible agency.
- It is needed to have cages, breeding facilities suitable to biological features of raising animals. Each type of animals is eligible to certain environment and has different customs in terms of actions and food seeking.
- It needs as well appropriate measures to ensure that raising animals can not escape to natural environment and vice versa, other animals can not enter raising stations.
- Ensure sufficient facilities and environment sanitation, particularly sewage system.
- Raised animals must have reproductive capacity in cages breeding conditions
- Have sufficient human resources on disease prevention and good knowledge on bred animals
- Have profiles, books recording and monitoring animals raising management.

For some animals as python and crocodile, FPD developed technical manure and monitoring, evaluation handbook of these 2 species.

To register for crocodile raising (animals listed on annex I of CITES), crocodile raisers have to provide every information on management and quantity of crocodiles raised. Vietnam CITES management agencies shall prepare and submit registration procedures to CITES' secretary board. Local forest protection sub-department shall investigate to identify accuracy of information provided by crocodile raisers, investigation is one of indispensable procedures on animals raising registration. Local forest protection sub-departments also requires individual raising stations to regularly report information on management, raising, reproducing and trading, investigate all raising stations in order to prevent illegal collection, hunting of wild animals for export.

Registered stations need to obtain permission from forest protection department (MARD) before slaughtering and skinning crocodiles. License is only granted after station owners send application to forest protection department addressing clearly species, dimension and ages of targeted crocodiles. FPsd is responsible for monitoring slaughtering and skinning activities and then marks CITES export

certificate at tail part of each skin. Annually, in September and October, registered stations are responsible to report to FPD tentative number of crocodiles to be slaughtered and skinned next year so FPD can order certificates.

Local FPsd is in charge of checking CITES registered stations, requires them to mark CITES export certificate and confirms number of reproduced crocodiles need to be marked. On the basis of these certificates confirmed by FPsd, CITES management agency in Vietnam shall order these CITES export certificate. Registered stations must obtain license issued by CITES management agency if they want to export crocodiles or its products. Export license must clearly indicate full name, address of exporters, importers; quantity, dimension, weight of products. In case of exporting crocodile leather, it is a must to indicate code of CITES export license.

Wild animals transportation: According to regulation on check-up of wood and forest products transportation, production and business issued along with Decision 47/199/QĐ-BNN-KL of MARD's Minister, transportation of wild animals must meet the following conditions:

- To be inspected and monitored by forest protection agency
- To obtain license on wild animals hunting issued by local forest protection section (for common wild animals).
- To obtain transportation license issued by local forest protection section (following integrated form).
- To obtain agreement letter of MARD (for rare and precious animals).
- To obtain special transportation license issued by local FPsd.
- For reproduced animals, owners of animals raising stations should have verification of local forest protection.
- To have invoice (business organizations, individuals) or list of purchased goods (if purchasing from local people).
- To have transportation license issued by local forest protection (unified form).

As for confiscated animals, it is needed to have receipt of forest products selling, transportation license issued by local forest protection. As for rare and precious animals, it is regulated to obtain special transportation license issued by FPsd.

In order to have license, station owners have to submit application to forest protection agency, clearly indicating purposes, quantity, species, original, destination, depart point, transportation duration provided with legal profiles of wild animals.

3.7. Wild animals preservation and use methods

Wild animals investigation and monitoring

Thanks to great efforts made by the Government and relevant organizations, activities related to bio-diversity preservation in general and wild animals in particular has been gradually improved in Vietnam. Number of legal papers

stipulated with an aim to adjust relations on wild animals hunting, trading, raising and preservation. Every decision on this policy is made based on scientific basis and comments from scientific agencies. Nevertheless, there remains certain obstacles during implementation process so as make it hard for management activities. Investigation and monitoring of wild animals, therefore, play great role. Based on this information, planners shall have better management plans and decision makers shall work out decisions in a more appropriate and timely manner.

Wild animals investigation and monitoring comprise 2 main contents:

Investigation on species composition, or in other word it is called flora, fauna investigation. This is site survey process to get information on number of existing species and their distribution on different environment. Findings from these surveys shall provide list of existing species according to classification system and a map on distribution of main species.

Deposits investigation: they are difficult site survey activities, that require more skills, experiences and resources. Important information from this survey shall respond to questions on how many individuals are there in a species on forest.

Hence, bio-diversity surveys shall provide fundamental information on flora, fauna and their distribution, quantity of communities. This information can be seen as foundation for further preservation and development activities (planning, research, ecology, etc.)

Bio-diversity monitoring: activities aims at evaluating changing trend on species compositions, community deposits, external impacts to community. Bio-diversity monitoring can provide information on:

Achievements of a plan (rehabilitation or new creation);

Outstanding objectives gained;

Inefficiency or less efficiency of financial expense and human resources in comparison with the set objectives;

Which issues (in the developed plan) need to be strengthened or adjusted;

Necessary changes to increase efficiency of management activities on environment rehabilitation, land use, bio-diversity preservation, climate changes, etc.

In practice, in order to ensure effectiveness of nature preservation activities, investigation should be all the time together with monitoring as a bio-diversity investigation and monitoring program. This program is usually designed at a certain area, conducted on cycle basis and applied integrated method.

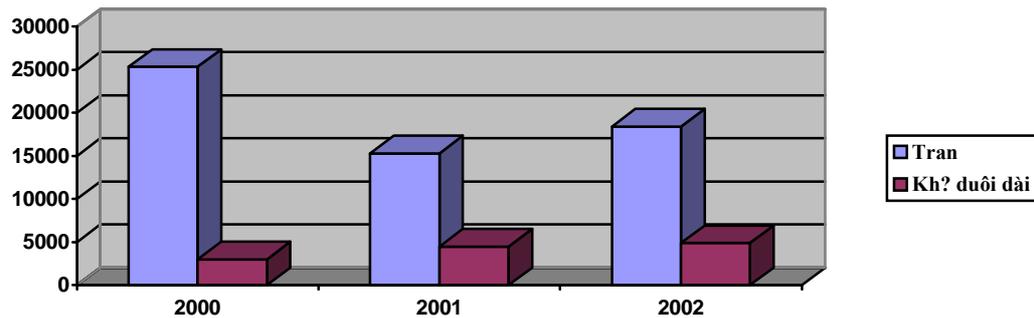
To undertake investigation and monitoring, it is crucial to identify: target group, investigators, area, time and reiterated cycle, fundamental conditions to satisfy requirements on investigation, monitoring as well as implementation approach, identification of expected outputs of the program and training is essential.

In Vietnam, investigation and monitoring of wild animals have not been conducted in a systematic manner. This activity has only been conducted in a small scale and in certain preservation areas. Monitoring, evaluation framework and investigation manual is limited and only available over the last 1-2 years. Currently, under financial support from SPAM project, FPD cooperates with some scientists to publish a handbook guiding investigation and monitoring of wild animals.

Communication, dissemination: One of the causes leading to decline of wild animals in general and animals resources in particular is community's awareness on preservation and law. That is why, it is vitally crucial to communicate and disseminate role of wild animals on environment and State's guidelines and policies on preservation and wild animals development. Currently, according to Decree nr. 39/CP dated 18/5/1994 of the Government on organizational structure, functions, tasks and authority of forest protection, forest protect is a specialized force responsible for forest management and protection. Besides, forest protection is also disseminate information in order to improve people's awareness. Communication and dissemination can be conducted under many ways:

- Dispatch forest rangers to village, hamlet to directly mobilize local communities to participate in forest and wild animal protection.
- Develop training programs for people directly involve in forest protection law enforcement. Develop newsletter, signals to disseminate responsibilities and obligations of local people on wild animals and plants protection.
- Publish and distribute leaflets on wild animals and plants protection to restaurants, hotels, stations and public places.
- One of the most important and effective way is to disseminate over mass media. As local people are final target group, so via mass media, a great number of people can listen to, watch and understand State's policies on forest protection and development. Press also plays important role to discover and fight against forest criminals. Through newspapers, number of illegal wild animals trading lines are discovered and timely treated.

Raising and developing wild animals: In recent years, movement on raising and developing of wild animals have strongly taken place in some provinces, particularly in Mekong river delta. Number of animals is successfully raised for commercial purpose, including python, crocodile, frogs and *Macaca fascicularis*. Over the last years, CITES management agency in Vietnam granted license for exporting some following commodities:



The successful reproduction of some wild animals not only has economic meaning (generate income and employment to local people) but also brings along with significant preservation meaning. Local people have income, employment so as help reduce forest pressure in general and increase existence opportunities for natural reproduced species. On the other hand, study on natural release some rare and precious species as python and crocodiles has significant meaning to preservation. At Cat Tien national park, a natural release program of crocodile species is being conducted. However, it needs considerable investment in terms of both finance and technique. Only purebred species are meaningful to wild animals and gene sources preservation. (*Annex VI. Species possible for reproduction*)

3.8. Measures on wild animals management and preservation

In every management sector, activities related to development of planning, mechanism, inspection policy play very important part for development of that sector. From 1962 to 1975, forestry sector identified 49 restricted forests on the north. From 1976 to 1986, after the liberation of the country, forestry sector conducted a survey in Central highland and south-east, south-west parts of Vietnam. In 1977, the Prime Minister issued decision to set up 10 restricted forests on the North of Vietnam with total area of 44.310 ha. Subsequently, with high biodiversity value forest, Chairman of Ministerial Council (now called Prime Minister) set up some restricted forests as:: South Cát Tiên (1987), Con Dao (1984). After 1994, forestry sector has cooperated with national and international scientists to conduct investigation and surveys. As results, number of restricted areas were set up as (Phú Quốc, Bạch Mã, Mùòng Nhé, Xuân Nha, Hoàng Liên Sơn, Bến En...)

Currently, a special use forest system is set up along country's length and represents different ecological systems in Vietnam including: 27 national parks, 67 nature preservation areas and around 30 culture-history and environment areas. Total area of special use forest is over 2 million ha, comprising very special bio-diversity values.

As stated in Law on organization of Government, MARD is responsible for overall management of special use forest, Ministry of Fisheries is in charge of marine preservation areas management, Ministry of Culture and Information takes over management of cultural – historical-environmental areas. Ministry of Natural resources and Environment is liaison agency to implement action plan on bio-

diversity and develop management plan of wet land preservation areas. MARD 1) develop legal framework related to special use forest management. 2) develop and submit plan, planning to Government for endorsement or ratify provincial plans, 3) develop capital plan for investing in nature preservation area establishment, 4) manage staff working in nature preservation areas, national parks, 5) directly manage important special use forests located on territories of several provinces. Other forests are managed by provincial people's committee.

Currently, the Prime Minister issues Decision nr. 192/QĐ-TTg ratifying strategy on management of nature preservation areas in Vietnam up to 2010. Hence, with this basis, series of measures, programs shall be implemented in coming years in order to improve quality of nature preservation areas.

3.9. Rescue wild animals

In Vietnam, rescue of wild animals has not been paid due attention, currently, activities on dealing with alive animals after confiscating from illegal trade and transportation cases are mainly relied on some alternative measures:

Release in nature, this measure is only applied to strong animals. However, it is difficult to identify original of confiscated animals, hence once being released in inappropriate environment, they may die or be killed by other animals or create ecological unbalance.

Destruction measure is applied to weak or died animals, though being a quick one, this measure often wastes property and pollutes environment.

Rescue measure shall bring opportunity to rehabilitate animals from illegal trade and transportation. After being rescued, animals shall be released in nature with appropriate environment. However, this measure entails considerable resources in terms of finance and human.

Soc Son wild animals rescue Center - Hanoi and Primates rescue Center – Cuc Phuong national park have sufficient conditions to receive small quantity of certain wild animals. However, these 2 zoos have not yet had any experimental program on wild animal release.

MARD is preparing to set up bear rescue center in Cat Tien National park, Dong Nai province.

3.10. Programs related to preservation and sustainable development

In recent years, environment, bio-diversity have become burning and urgent issues. Thanks to financial and technical support from international organizations provided with untiring efforts from Vietnam, the State has adopted and implemented number of programs related to preservation and sustainable development:

There are 2 important strategies ratified by the Government, which are directly linked to strategy on nature preservation area management of Vietnam up to 2010, they are: *Action plan on bio-diversity and forest development strategy 2001 - 2010*.

The Forest Sector Support Program (FSSP) is a Memorandum of Agreement signed by the Government and international donors, NGO aiming to make the best use of existing resources for the implementation of forest development strategy, including 5 million ha reforestation program (program 661).

On-going programs:

- Forest Sector Support Program (FSSP);
- Bio-diversity action plan;
- Strategy on comprehensive growth and poverty reduction;
- National strategy on advancement of women and 5 year action plan of this strategy;
- Socio-economic development strategy for 2001 - 2010;
- National environment protection strategy 2001 - 2010;
- Forest development strategy to 2010
- Strategy on management of nature preservation areas in Vietnam up to 2010.

Currently, MARD is developing action plan on wild animals and plants protection. Tentatively, this action plan shall be endorsed by the Government in 2004. This is a very important paper to provide foundation for preservation and development of wild animals in Vietnam.

3.11. Management cooperation between law enforcement agencies

The abovementioned on functions, tasks of forest protection agencies, police, market management, fisheries protection, border army has indicated crucial cooperation roles among these agencies in order to prevent wild animals trade, transportation and store. As regard to domestic market, forest protection, police and market management are driving forces in this aspect. Wild animals selling and displaying of its products is managed and inspected by market management force meanwhile forest protection is in charge of identifying if these products are legal or not. Police, forest protection are important forces in inspecting wild animal transportation.

Circular 144/2002/TTLT-BNNPTNT-BCA-BQP on 13/12/2002 guides cooperation between forest protection, police and army in forest protection under MARD, Ministry of Police and Ministry of national defense as follows:

- Cooperate to inspect, uproot illegal exploitation, transportation, purchasing, storing and processing wild animals and plants.
- MARD's responsibilities: Cooperate with Ministry of Police and National Defense Ministry to protect forest, prevent and timely deal with cases of deforestation, illegal hunting and consuming wild animals and plants.
- Ministry of Police's responsibilities: Instruct local police to cooperate with forest

protection to uproot any places where exists illegal hunting, purchasing, transportation of wild animals and plants.

- Ministry of National defense's responsibilities: Instruct army units to cooperate with forest protection force to uproot any places where exists illegal hunting, purchasing, transportation, storing and processing of wild animals and plants.

3.12. International Cooperation

The strengthening of international cooperation does not only create new energy to strengthen bio-diversity preservation in the country but also contribute to protect environment and preserve natural resources on global-wide.

If applying appropriate approach, Vietnam shall attract more and more financial and technical support from international projects in the field of nature preservation area management and bio-diversity preservation.

Despite great efforts, international cooperation in controlling wild animals trading in Vietnam is still limited and just at initial implementation steps. In the field of managing international trade on wild animals, Vietnam has become members of CITES convention since 1994 and currently there are 164 country members of this convention. This convention aims to bind all countries in controlling international trade of wild animals' specimen via registered framework. Apart from 2 scientific authorized bodies as Center on natural resources research and environment (Hanoi National University) and Institute of Ecology and biological resources, MARD is entrusted to implement this convention (CITES' office based at forest protection department). Managerial responsible agency is in charge of communicating with country members and CITES' secretary committee to manage legal import-export wild animals and plants in Vietnam without creating any negative impacts to existence of that species in nature. Through joining convention, Vietnam and other countries have bilateral, multilateral cooperation on controlling of plant and animals resources trading. Through CITES country members' conference held every two years, Vietnam shall partly contribute to decision making process to work out any decision on restriction or prohibition on international trade of any wild animals and plants' samples.

International cooperation activities are taken place under various forms as implementation of general study program on wild animals and plants trading in Vietnam and some other regional countries, cooperation on one hand via support program providing training on implementation of CITES and on the other hand implementation of some projects in special use forest of Vietnam, including wild animals trading control and establishment of centers rescuing wild animals and plants after being confiscated. However, these programs, projects are only conducted at Central level and mainly concentrates on MARD, Ministry of Science, Technology and Environment (now called Ministry of Natural resources and Environment) and Ministry of Fisheries provided with Vietnam's partners as NGO, support foundations, UNDP, IUCN, WWF, DANIDA and TRAFFIC, etc.

Agencies involve in law enforcement on wild animals management and protection as General department of Customs, Ministry of Police, Market management department, Veterinary department, etc. only implement international cooperation

within their sector. Wild animals control is rarely mentioned.

Interpol Vietnam has cooperated with international Interpol to control inter-nation criminals. However, there has not yet any concrete activities for wild animals and plants control.

Similar to Central level, international cooperation on wild animals control seem very rare at local level. Some forest protection sub-departments have international cooperation activities but only within project scope as PARC project in Ba Bể (Bắc Kạn), Na Hang (Tuyên Quang) và Yokdon (Đắk Lắk); Project on Buffer zone economic development in Pu Mat National Park (Nghệ An); Project on preservation of Cat Tien National park (Đồng Nai, Lâm Đồng); Project on rescue center of Primates and turtle rescue center in Cuc Phuong National park ((Ninh Bình)....

In general, international cooperation on wild animal management and trade in Vietnam has just been at beginning step. Some international cooperation activities are being implemented but rather fragmented and missing close linkages. These activities are mainly undertaken via cooperation programs, projects between NGO and Vietnamese agencies.

International cooperation activities with Indochina and ASEAN countries

With Laos: For the time being, Laos has not yet been a country member of CITES. Over the last years, Vietnam has cooperated with Laos (forest department – Ministry of Agriculture and Forestry), particularly with bordering provinces in the aspect of bio-diversity preservation via bio-diversity forum. Some cooperation relations are also set up between Laos and Ministry of Science, Technology and Environment (now called Ministry of Natural resources and Environment) and MARD. Competent agency on CITES management develops plan to support Laos to join this convention.

With Cambodia: Cambodia is CITES country member. Apart from information communication and exchange under convention system, Vietnam and Cambodia has not yet set up bilateral cooperation on wild animals and plants trading control. There were meetings between management agencies of the 2 countries but official cooperation relation has not yet set up.

According to FPD of MARD, in near future, Vietnam shall have cooperation program on wild animals, plants trading management with Laos and Cambodia.

With other ASEAN country: Currently, besides information communication and exchange under convention system, Vietnam has not yet had any specific cooperation activity with other countries in South East Asia region. Recently (9-2003), competent agency on CITES management in Malaysia visited and exchanged experiences with CITES management agency in Vietnam.

International cooperation with China:

There exists professional technical exchange and bilateral cooperation relation between CITES Vietnam and China in recent years, including Memorandum and Understanding signed between CITES management agency of Vietnam and China, which aims to discuss on strengthening cooperation between 2 countries in controlling of wild animals trade. Every 2 years, these two agencies meet to exchange experiences and information. However, concrete cooperation at Vietnam-

China bordering area on wild animals trading control has not yet been specified. Particularly, periodical meetings between agencies at border gates only remain at “exchange relation” in this aspect.

Findings from surveys at bordering area between Vietnam and China have indicated that 2 bordering provinces Quang Ninh (Vietnam) and Quang Tay (China) have not had any international cooperation on controlling of wild animals trade. Functional agencies as: FPs, Sub-department of customs, Sub-department of market management in Quang Ninh province have not had any cooperation with China, particularly on the aspect of wild animals trade control.

Chapter IV. Measures on strengthening wild animal management and preservation in future

In order to preserve and develop wild animals, it is necessary to conduct some following activities in the coming time:

- Review state's legal papers related to wild animal management and protection.
- Develop database serving inspection, monitoring planning and plan on wild animal management.
- Develop and submit action plan to inspect and control wild animals to Government for approval.
- Develop list of wild animals in Vietnam with clear definition on species prohibited and allowed for exploitation and use.
- Gradually undertake Strategy on management of nature preservation areas ratified by the Government in 2003.
- Strengthening international cooperation to take best advantages of financial and technical support on preservation activities. Closely cooperate with CITES' secretary committee and country members on wild animals import-export. Cooperate with neighboring countries to strengthen control along border line.
- Undertake awareness raising campaign; improve acknowledgement of all people ranks on wild animals protection in particular and bio-diversity in general. Furthermore, integrate preservation education into schools.
- Strengthen law enforcement, strictly deal with violence related to forest management, protection and illegal trade and transportation of wild animals.
- Enhance cooperation between law enforcement agencies and improve capacity for law enforcement groups.
- Decentralize in wild animal management and preservation.
- Accelerate scientific research, particularly on rescue and release wild animals into nature.
- Develop, upgrade wild animal rescue centers at 3 regions in terms of infrastructure, facilities and human resources.
- Strengthen inspection, monitoring of wild animals reproductive activities. Enhance activities on control of exotic species import that may lead to ecological unbalance and negatively impact to existence of some indigenous species.

Annex

Annex 1 : Definition of common terms

Animal ephemera	are vertebrate animals living on water, they do not settle in one fixed place but along water
Bio-diversity	is terminology to describe variety and diversification of creatures originated from sea and inland, inclusive of species diversification (genetically diversification or gene sources diversification), between species (species diversification) and ecological systems (ecological system diversification).
Endemic	Indicates one species, family, breed, etc. that naturally distribute in a narrow area of certain region or locality.
Common endemic animals	
Rare and precious endemic animals	
CITES annexes	CITES convention comprises 3 annexes (I, II and III), each annex is a list of various plants and animals including scientific title, commercial title and explanation. Annex I prohibits commercial business, annex II and III with control. It is required to have license for import-export of any species mentioned on these lists.
Raising for reproduction	is human's activities aiming to create animals regenerations under controlled cage raising conditions
Hoof animals	Mammal, grass eating animals with hoof as buffalo, cow, pig, horse, rhino etc.
Green corridor	Green belt (forest) connect large forest blocks or other plant scenery together as wet land, pasture, preservation area, etc.
Fauna	Comprising all kinds of animals living in one region, inclusive of both exotic and indigenous species.
Ecological system	A natural unit comprising all creatures and sterile factors of certain area with interactive interventions and substance exchange with each other.
Flora	Synthesis of plants classification levels (taxon) within certain topographical area, including alive indigenous or exotic plants
Non timber forest products	Every non timber biological products exploited from forest and used by people. Non timber forest products are diversified and used as foder, herbal, oil, root, fruit, wild animals, rattan etc.
Tropical rain forest	is wet tropical forest with evergreen broad leaves with rainfall over 2,000 mm in rainy season, dry season is not clear. Popular plant vegetation comprises a lot of plants with unclear storey classification. Majority of plants compositions

	is wood species with large dimension. Most of climbing and dependent plants are wood trunk, there are lots of parasitism.
Mangrove forest	Plants community allocating on alluvium, muddy or mixed muddy and sand at river mouth, coastal area and other tidy flooded areas that are not strongly hit by sea flow and waves. Mangrove forest comprises wood trees, bushes and some climbing species grown at tidy flooded wet land area on periodically basis. Mangrove forest plays important role to protect coastal area and considered as crucial scenery for existence on sea (fish dropping ground).
Primary forest	Primary forest is forest of primary status with no intervention from human being during development process
Buffer zone of nature preservation area	Buffer zone is marked area with explicit demarcation, with or without forest, nearby or outside nature preservation area, surrounding nature preservation area in order to prevent or mitigate encroachment to nature preservation. Every activity conducted in preservation area or buffer zone aims to support preservation activities inside nature preservation area or buffer zone, to restrict migration from outside to buffer zone under whatever way; to develop economics actively so as contribute to stabilize and gradually improve material, spiritual and cultural life of people living in buffer zone
Secondary forest	Forest is at process of re-growing after some changes occurred in primary forest as exploitation, fire or seriously damaged by pests.
Mass of living organisms	Total weight of every alive body of one animal or plant species on a square or cubic meter based unit (mass of species living organisms) or of all species living in community (mass of community living organism). Mass of living organisms is often reflected via gram number of organism on $1m^2$ or $1m^3$.
Rescue Center	Place to keep indigenous wild animals for rehabilitation once being sick, injured due to illegal hunting. It is better to maintain their wildness to release them into their indigenous environment
Level E	Endangered species (to be in danger)
Level V	Species to be endangered (may be in danger)
Level R	Rare species (may be risky)
Level T	Threatened species (not yet classified into the above-mentioned level due to insufficient data)

Annex II. Several rare and precious invertebrate animals

TT	Normal name	Scientific name	Red book Data	Nghị định 48	Annex CITES
1	Ốc sên (Snail)	<i>Achatinella spp</i>	Non	Non	I
2	Đĩa (Leech)	<i>Hinrudo medicinalis</i>	Non	Non	II
3	Giun xanh (Blue worm)	<i>Pheretima perelae</i> Thai	T	Non	Non
4	San hô trúc (Flute cophorbia)	<i>Isis hipputis</i> Linnaeus	R.	Non	Non
5	San hô Nhật Bản (Red Japan cophorbia)	<i>Corallium japonicus</i> Kishinouye	V	Non	Non
6	Cà gai đá (Rock echinus)	<i>Heterocentrotus mammilatus</i> (Linnaeus, 1758)	V	Non	Non
7	Hải sâm mít (Sun flower holothurian)	<i>Actinopyga mauritiana</i> (Quoy et Gaimard, 1883).	V	Non	Non
8	Bộ lá	<i>Phyllium succiforlium</i> Linnaeus	V	Non	Non
9	Cánh kiến đỏ	<i>Kerria lacca</i> (Kerr, 1782);	V	Non	Non
10	Cà cuống	<i>Lethocerus indicus</i> (Lepetetier et Serville, 1775).	R	Non	Non

Annex III. Common traded animals

Nr.	Vietnamese title	Scientific title	Distribution	Utilization purpose
	Bộ Cánh da	DORMĀPTORA		
	Họ Chồn dơi	Cynocephalidae		Meat, leather
1	Chồn dơi (Cây bay)	Cynocephalus variegatus		Meat, leather
	Bộ linh Trông	Primates		
	Họ Cu li	Loricidae		Meat, leather, ornamental
2	Cu li lớn	Nycticebus coucang	North, Central	Ornamental, medicine, research
3	Cu li nhỏ	Nycticebus pygmaeus	Whole country	Ornamental, medicine, research
	Họ Khỉ	Cercopithecidae		
4	Khỉ cộc	Macaca arctoides	Whole country	Ornamental, medicine, research
5	Khỉ vàng	Macaca mulatta	Whole country	Ornamental, zoo, medicine, research
6	Khỉ mốc	Macaca assamensis	Whole country	Ornamental, zoo, medicine, research
7	Khỉ đuôi dài	Macaca fascicularis	Central, south	Ornamental, zoo, medicine, research
8	Khỉ đuôi lợn	Macaca nemestrina	Whole country	Ornamental, zoo, medicine, research
9	Chà vá chân nâu*	Pygathrix spp.	Central, south	Ornamental, zoo, medicine, research
10	Voọc bạc	Presbytis cristata	South	Ornamental, zoo, medicine, research
11	Voọc mông trắng	Trachypithecus francoisi delacouri		
12	Voọc Hà Tĩnh	Trachypithecus francoisi hatinhensis	Central, South	
13	Voọc đen má trắng	Trachypithecus francoisi francoisi		
14	Voọc xám	Trachypithecus phayrei	North, north central	Ornamental, zoo, medicine, research
15	Voọc mũi hếch	Rhinopithecus avunculus	Tuyên Quang	
	Họ Vượn	Hylobatidae		Leather, meat
16	Vượn đen tuyền	Hylobates concolor concolor	North	Ornamental, zoo, medicine, research
17	Vượn đen má trắng	Hylobates concolor leucogenys	North	Ornamental, zoo, medicine, research

18	Vượn đen Hải Nam	<i>Hylobates concolor hainanus</i>		
19	Vượn đen siki	<i>Hylobates concolor siki</i>		
20	Vượn đen má hung	<i>Hylobates concolor gabriellae</i>	Central and South	Ornamental, zoo, medicine, research
	Bộ ăn thịt	Carnivora		
	Họ Chó	Canidae		
21	Chó rừng	<i>Canis aureus</i>	Đắk Lắk, Tây Ninh, Kiên Giang	
22	Sói đỏ	<i>Cuon alpinus</i>		
23	Cáo lửa	<i>Vulpes vulpes</i>	North	Leather, meat
24	Lửng chó	<i>Nyctereutes procyonides</i>	North	
	Họ Gấu	Ursidae		
25	Gấu chó	<i>Ursus malayanus</i>	Whole country	Leather, gall, born
26.	Gấu ngựa	<i>Ursus thibetanus</i>	Whole country	Leather, gall, born
	Họ Chồn	Mustelidae		
27	Chồn vàng	<i>Martes flavigula</i>	Whole country	
28	Rái cá lông mượt	<i>Lutra persipillata</i>	Kon Tum	
29	Rái cá lông mũi	<i>Lutra sumatrana</i>	Central, south	Leather
30	Rái cá thường	<i>Lutra lutra</i>	Whole country	Leather
31	Rái cá vuốt bé	<i>Aonyx cinerea</i>	Whole country	Leather
32	Lửng lợn	<i>Arctonyx collaris</i>	North, Central	
33	Chồn bạc má bắc	<i>Melogale moschta</i>	North	
34	Chồn bạc má bắc	<i>Melogale personata</i>	Whole country	
	Họ Cây	Viverridae		
35	Cây mực	<i>Arctictis binturong</i>	North, Central	Alive, Foodstuff
36	Cây tai trắng	<i>Arctogalidia trivirgata</i>	Whole country	Alive, Foodstuff
37	Cây vằn bắc	<i>Chrotogale owstoni</i>	North, Central	Alive, Foodstuff
38	Cây vòi mốc	<i>Paguma larvata</i>	North, Central	Alive, Foodstuff
39	Cây vòi đóm	<i>Paradoxurus hermaphroditus</i>	Whole country	Alive, Foodstuff
40	Cây gấm	<i>Prionodon</i>	North,	Alive, Foodstuff

		pardicolor	Central	
41	Cây hương	Viverricula indica	Whole country	Alive, Foodstuff
42	Cây giông tây nguyên	Viverra zibetha	Highland, Bắc Giang, Lạng Sơn	
43	Cây giông	Viverra zibetha	Whole country	Alive, Foodstuff
	Họ Cây lôn	Herpestidae		
44	Cây lôn	Herpestes javanicus	Whole country	
45	Cây móc cua	Herpestes urva	Whole country	
	Họ Mèo	Felidae		
46	Mèo gấm	Pardofelis marmorata	Whole country	Alive, leather, gall, born
47	Mèo cá	Felis viverrinus	Wide distribution	
48	Mèo rừng	Felis bengalensis	Whole country	Alive, leather, born
49	Beo lửa	Felis temmincki	Whole country	Alive, leather, gall, born
50	Báo gấm	Neofelis nebulosa	Whole country	Alive, leather, gall, born
51	Báo hoa mai	Panthera pardus	Whole country	Alive, leather, gall, born
52	Hổ	Panthera. tigris	Whole country	Alive, leather, gall, born
	Bộ có vòi	PRĀBĀSCUDAQ		
	Họ Voi	Qlephantidae		
53	Voi châu á	Qlephas maximus	Whole country	Tusk, leather
	Bộ móng guốc lẻ	Perissodactyla		
54	Họ Tê giác	Rhinocerotidae		
55	Tê giác một sừng	Rhinoceros sondaicus	Lâm Đồng, Đồng Nai	Tusk
	Bộ móng guốc ngón chẵn	Artiodactyla		
	Họ lợn	Suidae		
56	Lợn rừng	Sus scrofa	Whole country	Alive, foodstuff
	Họ Cheo cheo	Tragulidae		
57	Cheo cheo nam dương	Tragulus javanicus	Whole country	Alive, foodstuff
	Họ Trâu Bò	Bovidae		
58	Bò tót	Bos gaurus		
59	Bò rừng	Bos javanicus		

60	Bò xám	<i>Bos sauveli</i>	Highland	
61	Sao La	<i>Pseudoryx nghetinhesis</i>	Central	
62	Sơn dương	<i>Capricornis sumatraensis</i>	North, Central	Tusk, gall, born, alive
	Họ Hươu nai	Cervidae		
63	Nai	<i>Cervus unicolor</i>	Whole country	Meat
64	Hoẵng	<i>Muntiacus muntjak</i>	Whole country	Alive/ foodstuff
	Họ hươu xạ	Moschidae		
65	Hươu xạ	<i>Moschus brezovski</i>	North	
	Bộ Có Vây	PHALUDATA		
	Họ Tê tê	Manidae		
66	Tê tê vàng	<i>Manis pentadactyla</i>	North, Central	Alive, scale
67	Tê tê	<i>Manis javanica</i>	Central, South	Alive, scale
	Bộ gặm nhấm	RODENTIA		
	Họ Sóc Bay	Pteromyidae		
68	Sóc bay trắng đen	<i>Hylopetes alboniger</i>	Trung, Nam	Alive
69	Sóc bay lớn	<i>Petaurista petaurista</i>	Cả nước	Alive
	Họ Sóc cây	Sciuridae		
70	Sóc bụng đỏ	<i>Callosciurus erythraeus</i>	North	Alive/foodstuff, leather
71	Sóc đen	<i>Ratufa bicolor</i>	Whole country	Alive/foodstuff, leather
72	Sóc rừng	<i>Ratufa spp.</i>	Whole country	Alive/foodstuff
	Họ Dúi	Rhizomidae		
73	Dúi má vàng	<i>Rhizomys sumatrensis</i>	North	Alive/foodstuff
74	Dúi mốc	<i>Rhizomys pruinosis</i>	North, Central	Alive/foodstuff
	Họ Nhím	Hystriidae		
75	Nhím	<i>Hystrix hodgson</i>	North, Central	Alive/foodstuff
76	Şon	<i>Atherurus macrourus</i>	North, Central	Alive/foodstuff
	Bộ Thỏ	LAGAMORPHA		
	Họ Thỏ rừng	Leporidae		
77	Thỏ rừng Trung Hoa	<i>Lepus sinensis</i>	Lạng Sơn, Quảng Ninh	Alive/foodstuff

Annex IV. Legal papers related to wild life management

- 1- Instruction nr. 134-TTg, on 21-6-1960 of the Prime Minister prohibiting elephants shooting.
- 2- Decree Nr. 39/Governmental Council on 5-4-1963 promulgating temporary regulations on hunting forest birds.
- 3- Temporary regulation on forest animals and birds hunting.
- 4- Circular Nr. 40/LN dated 20-7-1963 of the General Forest department on explanation and guide the implementation of temporary regulation on forest animals and birds hunting.
- 5- Decision Nr. 276/QĐ dated 2-6-1989 of Ministry of Forestry stipulating regulation on management, protection and import-export of forest animals.
- 6- Regulation on management of forest animals import-export.
- 7- Law on forest protection and development on 12th August, 1991;
- 8- Decree Nr. 18 HĐBT on 17-1-1992 of Chairman of Ministerial Council regulating list of rare and valuable forest plants, animals and management, protection regime.
- 9- Circular Nr.13-LN-KL dated 12-10-1992 of Ministry of Forestry guiding the implementation of Decree Nr. 18 HĐBT on 17-1-1992 of Chairman of Ministerial Council regulating list of rare and valuable forest plants, animals and management, protection regime.
- 10- Instruction Nr.130-TTg dated 27-3-1993 of the Prime Minister on management and protection of rare and precious plants and animals.
- 11- Instruction Nr.283-TTg on 14-6-1993 of the Prime Minister on implementation of urgent measures on rare and precious wood management.
- 12- Official Dispatch nr.1888 LN/KL on 16-8-1993 of Ministry on Forestry sending to provincial People's Committee, Forest Department, Agriculture-forestry department guiding the implementation of Instruction nr. 283-TTg.
- 13- Official Dispatch Nr. 1817/KGVX on 31-12-1993 of the Government's Office announcing the Prime Minister's opinion on Vietnam's participation into CITES convention.
- 14- Decision Nr. 844-TCLĐ dated 5-8-1994 of Minister on Forestry assigning forest protection department to represent Ministry of Forestry in undertaking function of CITES management agency in Vietnam.
- 15- Official Dispatch Nr.551/LN/KL on 21-3-1994 of Ministry on forestry sending to provincial People's Committee and cities on strengthening wild life protection.

- 16- Decree Nr.62/CP of the Government on 5th January, 1995 regulating conditions for carrying out or not carrying out business on rare and precious forest plants and animals;
- 17- Decree Nr.01/CP on 3rd January 1996 on sanction against administrative violence on trading aspect – sanction methods applicable to breaking conditions on business, commodities export on quota basis (inclusive of those regulated in CITES annex).
- 18- Decree Nr.26/CP of the Government on 26th April 1996 on sanction against administrative violence on environment protection – sanction levels applicable to illegal exploitation and trade of dangerous and pressing animals;
- 19- Instruction Nr.359-TTg on 29-5-1996 of the Prime Minister on urgent measures for protection and development of wild life.
- 20- Official Dispatch Nr. 2472 NN-KL/CV dated 24-7-1996 of MARD sending to DARD, Forest protection sub-department and Vietnam Forest products corporation on strengthening protection and development of wild life.
- 21- Circular Nr.04 NN/KL- Prime Minister on 5-2-1996 of MARD guiding the implementation of Decree nr. 02-CP on 5-1-1995 of the Government regulating commodities, services prohibited and not prohibited for business with conditions in domestic market.
- 22- Official Dispatch nr. 280/BNN-KL of forest protection department on 25th October, 1996 on exploitation and use of rare and precious forest plants, animals under group I and II of Decree 18/HĐBT;
- 23- Decree nr. 77 of the Government on 29th December 1966 on management and protection of forest, forest products;
- 24- Circular nr.01/NN-KL-TT of MARD dated 18th February, 1997 guiding the implementation of Decree Nr. 77/CP on sanction against administrative violence on forest, forest product management and protection; prohibition of illegal hunting, trading and transporting forest animals (excluding cases with license);
- 25- Decree nr.11/1999/NĐ-CP dated 3-3-1999 of the Government regulating commodities prohibited for circulation, commercial services; commodities prohibited for circulation, commercial services with limited business, business with conditions.
- 26- Official Dispatch nr. 390/KL-BTTN of Forest Protection department on 9th September, 1999 sending to forest protection sub-department guiding procedures for registration of crocodile raising for export, formulating procedures on registration and management of crocodile raising stations;
- 27- Decision Nr.47/199-QĐ-BNN-KL dated 12-3-1999 of Minister on Agriculture and Rural development stipulating regulations on transportation, production and trade of wood and forest products.
- 28- Regulations on supervising wood and forest products transportation, production and business.

- 29- Decision Nr.242/1999/QĐ/TTg dated 30-12-1999 of the Prime Minister on executing commodity import-export in 2000.
- 30- Code of Criminal of the Socialist Republic of Vietnam promulgated on 4th January, 2000;
- 31- Decision nr. 140/2000/QĐ/BNN-KL, on 21-12-2000 of MARD's Minister announcing list of some wild animals as natural enemies of mouses.
- 32- Decision nr.43/2000/QĐ-BNN-TCCB dated 19/4/2000 on establishment of CITES office in Vietnam.
- 33- Decision Nr.140/2000/QĐ.BNN-KL dated 21/12/2000 of MARD's Minister on list of some wild animals as natural enemies of mouses.
- 34- Official Dispatch Nr.637/KL-BTTN of forest protection department on 2nd November 2000 guiding professional techniques on wild animals and plants management;
- 35- Instruction Nr.12/CT-TTg of the Prime Minister dated 16/5/2003 on strengthening urgent measures on forest protection and development.
- 36- On 9/11/2003, MARD promulgated Circular Nr. 123/2003/TT-BNN-KL guiding the implementation of Decree nr. 11/2002/NĐ-CP of the Government controlling international trade on wild animals and plants.

Annex V. Summary of main contents related to wild life

TT	Legal document	Summary of main contents
01	Law on forest protection and development (12/8/1991)	<ul style="list-style-type: none"> - Article 3: For forest animals, excluding rare and precious species to be protected and not to be hunted according to State's regulations, forest owners are entitled to exploit and develop usual forest animals as regulated; Forest owners are entitled to special incentive policies if they successfully protect and develop rare and precious species. - Article 19: exploitation and hunting of forest plants and animals must follow State's regulation; rare and precious forest plants, animals must be managed and protected under special regimes. - Article 20: it is strictly prohibited to destroy, burn forest, encroach forest and forest land, exploit, and trade forest products, hunt forest animals regulated in law. - Article 25: exploitation of forest plants and animals must be endorsed by MARD; internal import of forest plants and animals must follow biological principles and national quarantine regulations, without creating any harm to ecological system and must obtaining MARD's permission.
02	Criminal Code 2000 (04/01/2000)	<ul style="list-style-type: none"> - Article 175: crime on breaking regulations on forest exploitation and protection. - Article 190: crime on breaking regulations on protection of rare and precious animals. - Article 190: crime on breaking special protection regimes applicable to nature preservation area.
03	Law on Environment protection (27/12/1993)	<ul style="list-style-type: none"> - Strictly prohibit exploitation, trade of rare and precious animals under regulated list of the Government. - Strictly prohibit the use of mass destruction tools, instruments in exploitation and hunt animals, plants sources.
04	Ordinance on protection and development of aquaculture resources 25/4/1989	<ul style="list-style-type: none"> - Article 1: Aquaculture resources comprise every economical, scientific value oriented organisms living on inland water bodies, sea areas, bordering or economic privileged, continental areas of Vietnam - Article 5: It is trictly prohibited any actions creating negative impacts to resources, inhabitation environment of various aquaculture species as well as protection and development of aquaculture resources. Article12: It is prohibited to catch, organize consumption of aquaculture species of high economic value, rare, precious or at the edge of extinction, which are indicated on the protected species list regulated by Ministry of Fisheries and guidance on producing breeds of these

		cited species.
05	Ordinance Sanction against administrative violence 02/7/2002	<ul style="list-style-type: none"> - Article 1: regulations applicable to sanction against administrative violence applicable to individuals, organizations who are not criminal but unintentionally or purposely break legal regulations on state administration, shall be dealt with sanction against administrative violence in conformity with law. - Article 14: sanction against administrative violence on forest, forest products management, protection; aquaculture resources protection, protection and quarantine of plants, animals, etc. can fine up to 30,000,000 vnd. - Article 35: regulating authority to deal with administrative violence of: forest rangers at work, head of forest protection unit and station, head of mobile protection group; director of forest protection sub-department, director of forest department. Fining level varies from warning to maximum fining, taking away license use right, professional practicing certification, confiscating proofs and means used to break legal regulations or being obliged to overcome consequences (depending on entrusted authority for different positions).
06	Article Nr.18-HDBT Regulating list of rare and precious forest plants, animals and management, protection regime. Ministerial Council 17/01/1992	<ul style="list-style-type: none"> - Rare and precious forest plants, animals comprise those of special scientific, economic and environmental value with limited quantity or are at the edge of extinction. They are divided into 2 groups according to their nature and rare level. <ul style="list-style-type: none"> + <i>Group IA, IB</i> are endemic species with special scientific and economic value with limited quantity or at the edge of extinction. + <i>Group II (IIA, IIB)</i> are high economic value species which are being over exploited resulting in limited quantity and extinction danger. - It is strictly prohibited to exploit, use rare and precious forest plants, animals under group I and at the same time restrict the exploitation and use of rare and precious forest plants and animals under group II. - Specific regulation on management, protection, encouragement, support and ensure rights and benefits for organizations, individuals in the aspect of protection and development of rare and precious forest plants and animals resources.
07	Decree Nr 48/2002/NĐ-CP Revising and supplementing list of rare and precious wild	<ul style="list-style-type: none"> - Regulating list of rare and precious plants and animals including: <ul style="list-style-type: none"> + prohibition for exploitation and use of: 16 wild plants under group IA, 58 wild animals under group IB + restriction on exploitation and use of: 28 plants under group IIA, 51 animals under group IIB

	plants, animals issued along with Decree nr. 18-HĐBT on 17/01/1992 of Ministerial Council regulating list of rare and precious plants, animals and management, protection mechanism. 22/4/2002	- Management and protection regime is conformity with regulations stated at Decree nr. 18- HĐBT.
08	Decree Nr. 11/2002/ NĐ-CP On management of wild plants, animals import-export and transit. 22/1/2002	Specifically regulate import, export, re-export, domestic import from specimen of wild plants and animals according to regulations of CITES and the Socialist Republic of Vietnam. - Prohibit import-export, re-export, domestic import specimen of wild animals and plants – under commercial purpose – regulated at annex 1 of CITES convention. These actions can only take place with these following conditions: non commercial purpose, conformity with Vietnam law, obtaining license granted by Vietnam competent agency responsible for CITES management. - Article 4: for animals, plants regulated at annex II: these actions can only take place once obtaining CITES’ license; regulations on conditions for import-export, domestic re-export, import from sea. - Article 5: regulating conditions for import-export, re-export, domestic import from sea applicable to species under annex III. - Chapter III regulating export, import specimen from plants and animals of CITES, originated from reproduction, clone and artificial insemination; - Chapter IV regulating export, import specimen from rare and precious wild plants, animals in accordance with regulation of Vietnam law. - Chapter V regulating export, import specimen from popular wild animals and plants. - Chapter VI, VII, VIII, IX: regulating competent agency on CITES management in Vietnam, CITES scientific agency, agency on granting license, certification on import, export, supervision, monitor and deal with violence
09	Decree Nr.77-CP On sanction against	- Regulating fining levels, fining authority, procedures, application of different measures on prevention, deal with material evidence of violence that break state

	<p>administrative violence on forest management, protection and forest products management. Chính phủ 29/11/1996</p>	<p>regulation on forest protection, management and forest products management but its severity is at the level of being tracked down criminal responsibility. - Article 3 regulating cases can not be dealt with administrative fine but being tracked down criminal responsibility: they are cases that cause damages beyond maximum level within administrative fine framework or cases of illegal exploitation, hunting, transportation, purchase or selling rare and precious forest products under group I.</p>
10	<p>Decree Nr.17/2002/ ND-CP Revising and supplementing some articles of Decree nr. 77/CP on 29/11/1996 of the Government on sanction against administrative violence in the field of forest management, protection and forest products management. 08/0/2002</p>	<p>- Regulating revision, supplementation and adjustment of damages level for some violence; regulating maximum financial fining level is 50 million vnd; - Regulating violence on rare animals, plants protection under group I or annex I of CITES convention shall not be dealt with administrative sanction but track down criminal responsibility.</p>
11	<p>Decision Nr.46/2001/QĐ-TTg On commodity import-export management for period 2001-2005 Prime Minister on 04/4/2001</p>	<p>- Regulating list of commodities prohibited for import-export for period 2001-2005, inclusive of wild animals and plants, natural rare and precious plants (annex 01), prohibition on export or issue license on export of wild animals and plants (annex 03).</p>
12	<p>Decision Nr.47/1999/ QĐ-BNN-KL Stipulating regulations on supervision of wood and forest</p>	<p>- Regulating wild animals transportation documents. + In general (it is a must to obtain license on wild animals hunting provided with transportation license issued by perspective local forest protection station). + Rare and precious (it is a must to obtain permission from MARD and special transportation license issued by perspective local forest protection sub-department).</p>

	products transportation, production and trade. MARD 12/3/1999	+ Wild animals originated from reproduction (it is a must to obtain verification from local forest protection sub-department for organizations, individuals engaged in reproduction or multiplication in addition to transportation license issued by perspective forest protection station).
13	Decision Nr.140/2000/ QĐ-BNN-KL Publishing list of wild animals as natural enemies of mouse MARD on 21/12/2000	- Article 2 regulating prohibition of natural forest oriented wild animals exploitation as indicated in this list. Any action breaks this or other regulations must be dealt with in accordance with the existing law.
14	Instruction Nr.359/TTg On urgent measures to protect and develop wild animal Prime Minister 29/5/1996	- Competent agencies have to strengthen supervision, control of illegal hunting, trading, transporting, exporting and keeping wild animals in all over the country. Every organization, individual break regulation has to be strictly dealt with according to law. - Confiscated wild animals meeting standards through quarantine shall be released into their inhabitation. In case of need, they are bred for multiplication in state's agencies or zoos regulated by MARD. - Strengthen check-up and confiscation of hunting guns, prohibit restaurants, hotel from serving wild animals dishes; prohibit shops from displaying, selling products produced out of natural wild animals. - Encourage raising and developing wild animals for business and export.
15	Instruction Nr.12/2003/CT - TTg On strengthening urgent measures on forest protection and development.	* Instruct to undertake the following measures: - Unite local police, army, border army, protection force, etc. to uproot illegal forest exploiters, strictly deal with violence, supervise and coerce all spontaneous migration out of primary forest, special use forest, and watershed protection forest and resettle them in a planned area. - Instruct people's committee at various levels to undertake state management over forest ... - Revoke business license of illegal wood trading and processing stalls and restaurants prepare dishes out of rare and precious animals ...
16	Circular Nr.04/NN-KL-TT Guiding the	- Specific regulation on prohibition of wild animals export and permission of wild animals export under control and other regulations on exploitation and

	<p>implementation of Decree nr. 02/CP on 05/02/1996 of the Government</p>	<p>transportation before export.</p> <ul style="list-style-type: none"> - Regulating the import of wild animals breed must ensure biological principles and regulations on national quarantine, without creating any harms to ecological system and must obtain license from MARD, import license from CITES Vietnam granted to individual specific cases in accordance with forest animals as regulated in CITES convention. - Regulating specifically internal trading and dealing with confiscated proofs as wild animals. <p>+ As for alive animals.</p> <ul style="list-style-type: none"> * Rare and precious species regulated at Decree nr. 18-HĐBT to be released into forest or transported to rescue station, breeding station, breeding research & multiplication station or zoo. * Common animals are released into forest, transported to multiplication stations, zoo or liquidating, fining for use. <p>+ As for weak, injured animals and their products.</p> <ul style="list-style-type: none"> * Rare, precious species regulated at Decree nr. 18-HĐBT to be handed over to museums or research & training unit as specimen * Common species are liquidated or fined for use. <p>+ Destroy confiscated animals and plants with disease incidence found via quarantine.</p>
17	<p>Circular Nr.62/2001/TT-BNN Guiding import-export of agricultural products in accordance with Decision Nr. 46/2001/QĐ-TTg on 04/04/001 of the Prime Minister on 05/6/2001</p>	<ul style="list-style-type: none"> - Specifically guide import-export of rare and precious wild life. - Specifically regulate prohibition of export under commercial purpose and permission of export wild life under certain conditions.
18	<p>Circular Nr.72/2001/TT-BNN-KL Supplementation and revision of some article in Circular Nr. 62/2001/TT-BNN</p>	<ul style="list-style-type: none"> - Part 3 – provision 1: revision of sentence (b) under provision 2.2 (part 2, chapter II).Circular Nr. 62/2001/TT-BNN as follows: revise F2 as F1 "...it is entitled to export products from F1 generation upward..."

	dated 05/6/2001 of MARD. BỘ NN & PTNT 09/7/2001	
19	<p>Circular Nr.144/2002/TTLT -BNNPTNT-BCA- BQP Guiding cooperation between protection force, police and military in the field of forest protection. MARD + Ministry of Police + Ministry of National Defense on 13/12/2002</p>	<p>- Cooperate to monitor and uproot illegal exploitation, hunting, transportation, storing and processing wild plants and animals. + MARD's responsibilities: Cooperate with Ministry of Police, Ministry of National Defense to protect forest, prevent and deal timely with cases of illegal deforestation, hunting and consuming of wild life. + Responsible of Ministry of Police: Instruct local police to cooperate with forest protection force to uproot exploitation, hunting, trading and transporting of wild life. + Responsible of Ministry of National Defense: Instruct military force to cooperate with forest protection to uproot illegal exploitation, hunting, transportation, storing and processing of wild life.</p>

Annex VI. List of wild animals legally registered for raising

Nr.	Title	Scientific title	Decree 48	Preservation status (CITES ' annex)	Quantity (estimation)
1	Khỉ Đuôi dài	<i>Macaca fascicularis</i>	II	II	20.000
2	Khỉ Vàng	<i>M. mulatta</i>	II	II	Không rõ
3	Cá Sấu Xiêm	<i>Crocodylus siamensis</i>	I	I	40.000
4	Cá Sấu hoa cà	<i>C. porosus</i>	I	I	200
5	Cá Sấu Cu ba	<i>C. rhombifer</i>		I	100
6	Trăn đất	<i>Python molurus</i>	II	I	20.000
7	Trăn vàng	<i>Python reticulatus</i>	II	II	30.000
8	Rắn Hổ mang	<i>Naja Naja</i>	II	II	+
9	Tắc kè	<i>Gecko gecko</i>		No	+
10	Thằn lằn nâu	<i>Gecko auratus</i>		No	+
11	Thằn lằn bông	<i>Gecko mamorata</i>		No	++
12	Kỳ tôm	<i>Physignathus cocincinus</i>		No	++
13	Kỳ sùng	<i>Acanthosaurus armata</i>		No	+
14	Kỳ nhông	<i>Calotes emma</i>		No	+
15	Liu điu chỉ	<i>Takydromus sexlineatus</i>		No	Rất nhiều
16	Thạch sùng	<i>Hemidactylus spp.</i>		No	+
17	Rắn mối	<i>Mabuya spp.</i>		No	+
18	Ba ba tron	<i>Pelea sp.</i>		No	500-700 tấn
19	Nhái bầu	<i>Microhyla pulchra</i>		II	đùi ếch/năm
20	Ếnh ương	<i>Kaloula pulchra</i>		No	+
21	Nhái cây	<i>Rhacophorus spp.</i>		No	++
22	Ếch đồng	<i>Rana tigerina</i>		No	
23	Cóc	<i>Bufo melanostic</i>			
24	Bò cạp đen	<i>Heterometrus spp.</i>			
25	Ba ba gai	<i>Pelea steindachneri</i>			

Some wild life species potential for propagation

Tên Việt Nam	Tên khoa học	Tình trạng bảo tồn			
		SDVN	NĐ48	CITES	IUCN
Khỉ vàng	<i>Macaca mulatta</i>		IIB	II	LR
Khỉ cộc	<i>Macaca arctoides</i>	V	IIB	II	VU
Khỉ mốc	<i>Macaca assamensis</i>	V	IIB	II	VU
Khỉ đuôi lợn	<i>Macaca nemestrina</i>	V	IIB	II	VU
Cây vòi mốc	<i>Paguma larvata</i>			III	
Cây hương	<i>Viverricula indica</i>		IIB	III	
Nai	<i>Cervus unicolor</i>				
Hoẵng	<i>Muntiacus muntjak</i>				
Kỳ đà hoa	<i>Varanus salvator</i>	V		II	
Rắn ráo thường	<i>Ptyas korros</i>	T			

Rắn ráo trâu	<i>Ptyas mucosus</i>	V		II	
Rắn cạp nong	<i>Bungarus fasciatus</i>	T			
Rắn cạp nia	<i>Bungarus sp.</i>				
Rắn hổ mang	<i>Naja naja</i>	T		II	
Rắn hổ chúa	<i>Ophiophagus hannah</i>	E	IB	II	

Annex VII. Agencies and organization with international cooperation activities

Nr.	Agency	Cooperation form
National agencies		
1	MARD	Instruct general cooperation
	a) Forest Protection Department	Cooperate with countries, international organizations and funds that are interested in natural preservation in Vietnam.
	b) Veterinary Department	Cooperate in the field of disease control and animals, plants quarantine when import-
	c) Plant Protection Department	Cooperate in managing import-export of plant protection chemical and internal import of strange plants.
2	Ministry of Police	Cooperate to arrest and deal with violence
	a) Interpol	Cooperate with International Interpol network to control inter-nations criminals
	b) Economic Policy Department	Cooperate in investigation and prosecution of economic trials
3	Ministry of Finance - General department of Customs	Cooperate in management of commodity import-export including wild animals and plants- This is the most important agency in implementation of the convention
4	Ministry of Fisheries, Department on Fisheries resources management and protection	Undertake international cooperation in fisheries import-export
5	Ministry of natural resources and environment – Environment protection dept.	Undertake international cooperation in protection of nature, bio-diversity and environment
6	Center on Research of Natural Resources and Environment, Ha noi National University	Carry out researches on natural resources, environment and undertake international cooperation on research and protection of wild animals and plants in Vietnam. This Center is one of two scientific authorized bodies of CITES Vietnam
7	Institute on ecology and creature resources,	This is a scientific agency carrying research on creature resources of Vietnam, there are also

	National Center on natural science and technology	international cooperation projects on research and preservation of wild animals and plants in Vietnam. Apart from that this Institute is also a second scientific authorized body of CITES Vietnam
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International NGO involved in bio-diversity and wild life preservation in Vietnam

Nr	Agency	Cooperation	Vietnamese Counterpart
1	CITES /UNEP Convention	Liasor on technique and information on implementation of CITES convention	MARD, CRES, IEBR & relevant Ministries
2	Secretariat	Liasor on information and support to country's members	relevant Ministries
3	Country's members (156 country)	Cooperate and exchange information and jointly control import-export of wild animals and plants	CITES Vietnam and relevant Ministries
4	Interpol	Cooperate and exchange information with all country's members on information related to wild animal and plants illegal trading	Ministry of Police
5	International Customs	Cooperate and exchange information with all country's members on import-export of wild animals and plants	Ministry of Finance, General dept. of Customs and relevant Ministries
6	TRAFFIC	Cooperate and support countries to manage and monitor wild animals and plants trading	MARD, CRES, IEBR & some other agencies
7	IUCN	Coordinate with TRAFFIC to provide technical support on management and control of wild plants and animals protection	MONRE, Ministry of Fisheries, CRES, IEBR, ECOECO and localities, etc.
8	WCMC	Provide information on animals and plants trading of CITES' country members	MARD
9	WWF	Cooperate, provide technical and financial support to control wild animals and plants trading and nature preservation	MARD, MONRE, Ministry of Fisheries, CRES, NCST and provinces, etc.
10	DANIDA	Denmark Assistant and Development Fund. This is one of the funds that best finance wild animals and plant preservation programs	MARD, MONRE, NGO and provinces, etc.

11	U.S. Fish and Wildlife Service	This is American's CITES agency that cooperates and finances research, training for capacity building to implement CITES and protect rare and valuable animals and plants of Vietnam	FPD, CRES, IEBR, NGO, provinces and national parks
12	FFI	Cooperation on research and protection of wild animals and plants	MARD, NCST, CRES, Universities, provinces and nature preservation areas
13	Birdlife International	Cooperation on investigation, research and protection of wild animals and plants (focus on bird)	MARD, CRES, IEBR, provinces and nature preservation areas
14	Wildlife at Risk	This organization operates activities related to wild life protection. Recently, this organization has cooperated with forest protection sub-department in HCMC.	MARD, provinces, etc.
15	CARE	CARE provide strong support to nature preservation, some ongoing projects also comprise relevant components on wild life management. CARE is also one of big donors, hence Vietnam should take advantages of its financial and technical support on nature preservation and prevention of wild life trading	Provinces, national parks and nature preservation areas
16	ITTO - International Tropical Timber Organization	This Tropical Timber organization has not yet had any specific or direct activities in Vietnam, so far cooperation is at level of information exchange.	MARD
17	UNDP	This organization strongly supports Vietnam in preservation area, including preservation of wild plants and animals. Particularly PARC project.	Ministries, agencies, provinces, national parks and nature preservation areas
18	World Bank	This is a big donor for nature preservation in Vietnam, particularly over the last 5 years. Vietnam should take advantages of WB's support via projects directly	MARD, MONRE, Ministry of Fisheries, provinces, national parks, nature preservation areas and NGO

		related to wild life trading and nature preservation.	
19	ENV	This NGO undertake activities on preservation education and monitoring of wild animals and plants trading.	Some National Parks and nature preservation areas
	Embassies in Vietnam	It is critical without mentioning activities and support to nature preservation of various Embassies based in Vietnam. Particularly direct financing on p research, survey, awareness raising programs related to preservation and management of wild life trading. These are very practical activities and finance is directly disbursed on preservation activities. This is important support from international friend and reflects interest of other countries on preservation and wild life trading management in Vietnam.	IEBR, CRES, NGO, National parks, preservation areas, provinces.

Reference

Reference documents in Vietnamese

1. Pham Binh Quyen, 1993. Insect life. Technical and Science Publishing House , 228 pages.
2. Pham Binh Quyen, 1994. Entomological ecology. Educational Publishing House, Hanoi, 120 pages.
3. Hinrich, Vu Phi Hoang et al, 1997. Policy and management of environment in Vietnam, Hanoi, 216 pages.
4. Ministry of Science, Technology and Environment, 2000. Red book of Vietnam – part on animal. Technical and Science Publishing House, Hanoi, 408 pages.
5. Thai Tran Bai, 2001. Book on invertebrate animals. Educational Publishing House, Hanoi.
6. Vietnam-Russian Tropical Center, 2001. Set of scientific report on tropical ecology of Vietnam-Russian Tropical Center – period 1988 - 2001. Ha noi, 119 pages.
7. Vũ Trung Tạng, 2002. Ocean and wonderful life. Educational Publishing House, Hanoi, 256 pages.
8. Le Trong Cuc, 2002. Biodiversity and nature preservation. National University Publishing House, Hanoi, 248 pages.
9. Phung Ngoc Dinh, 2002. East Sea resources in Vietnam. Educational Publishing House, Hanoi, 64 pages.
10. Tran Kien, Tran Hong Viet, 2001. Verterbrate animals. Educational Publishing House, Hanoi.
11. Nguyen Xuan Dang, Pham Nhat, 2000. Introduction on some Indochina and Thai Land animals. Technical and Science Publishing House
12. Pham Nhat, 2002. Monkeys of Vietnam. Agriculture Publishing House, 111 pages.
13. Government of Vietnam and the Global Environment Fund Project VIE/91/G31. Bio-diversity action plan of Vietnam, 1995. Hanoi.
14. Hon Mun sea preservation area project, 2003. Training on management of coastal preservation area. Nha trang 4-16/8/2003.
15. Kate Blazeby, Le Nguyen Nhat, Đỗ Quang Thái and Nguyễn Quang Trường, 1999. Analysis of momentum on wild life trading on Pu Mat nature preservation area. Nghe An Social forest and nature preservation, ALA/VIE/94/24.
16. Environment Department, Ministry of Science, Technology and Environment, 2001. Guidance on bio-diversity convention.
17. Environment Department, MOSTE 2001. National strategy on environment protection 2001 – 2010 (draft). World Publishing House
18. National Committee on Science and Technique, 1981. Results from basic investigation of animals in northern area of Vietnam (1955 - 1975). Science and Technical Publishing House, 476 pages.

Reference documents in English

1. Tonny Soehartono and Ani Mardiasuti, 2002. CITES Implementation in Indonesia. Nagao Natural Environment Foundation.

2. Ministry of Forestry, 1995. Vietnam Forestry. Agricultural Publishing house
3. Dr. John Mackinnon, 1990. Forestry sector review tropical forestry action plan Vietnam. Ministry of Forestry.
4. Michael Baltzer, Nguyen Thi Dao and Robert G. Shore, 2001. Towards a vision for biodiversity preservation in the forests of the lower Mekong ecoregion complex. WWF Indochina.
5. Jeffrey A. Mcneely, 1998. Economics and Biological Diversity, Developing and using economic incentives to conserve biological resources. International Union for preservation of nature and natural resources, Gland Switzerland.
6. Alexander Monastyrkii and Alexey Devyatkin, 2002. Common Butterflies of Vietnam. Labour and Social publishing house, 64 pages.

