

## Conservation status of Vietnamese primates

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### Summary

In Vietnam 6 primate genera and 24 primate taxa are recognized. Six taxa are endemic to the country: Con Dao long-tailed macaque (*Macaca fascicularis condorensis*), Delacour's langur (*Trachypithecus delacouri*), Cat Ba langur (*T. poliocephalus poliocephalus*), grey-shanked douc langur (*Pygathrix cinerea*), Tonkin snub-nosed monkey (*Rhinopithecus avunculus*) and eastern black gibbon (*Nomascus nasutus*). The IUCN Red List classified 6 taxa as "Critically Endangered", 9 taxa as "Endangered", 6 taxa as "Vulnerable", 1 taxon as "Near Threatened" and only 2 taxa as "Least Concern". Five endemic species to Vietnam are listed as "Critically Endangered" and face a very high risk of extinction. All primates are protected under the wildlife protection law, but the main threat for the primates is poaching, mostly for the use in traditional medicine but also for food and for the pet trade. Habitat destruction through fuel-wood collection, logging, agriculture encroachment, and often in connection with poaching, has also an increasing impact to the population decrease. Most, if not all populations are already highly fragmented.

Despite an increasing knowledge during the last years about the systematic classification, distribution, threats and also about biology and ecology of the primates in Vietnam more detailed studies are necessary to improve the protection and to save the survival of several species.

## Tình trạng bảo tồn các loài linh trưởng Việt Nam

### Tóm tắt

Bộ thú linh trưởng ở Việt Nam có 6 giống, 24 loài và phân loài được ghi nhận. Có 6 loài đặc hữu gồm: Khỉ đuôi dài Côn Đảo (*Macaca fascicularis condorensis*), voọc mõng trắng (*Trachypithecus delacouri*), voọc Cát Bà (*T. poliocephalus poliocephalus*), voọc chà và chân xám (*Pygathrix cinerea*), voọc mũi hếch (*Rhinopithecus avunculus*) và vượn đen đông bắc (*Nomascus nasutus*). Trong sách đỏ IUCN, có 6 loài "Cực kỳ nguy cấp", 9 loài "Nguy cấp", 6 loài "Đe bị tổn thương", 1 loài "Bị đe dọa" và 2 loài "Ít quan tâm". Năm loài linh trưởng đặc hữu của Việt Nam đều được xếp vào tình trạng "Cực kỳ nguy cấp" và có nguy cơ bị tuyệt chủng rất cao. Mặc dù tất cả các loài linh trưởng được bảo vệ bởi luật bảo vệ động vật hoang dã, tuy nhiên các mối hiểm họa như: săn bắt trái phép, sử dụng linh trưởng làm thuốc, thức ăn và buôn bán sinh vật cảnh vẫn phổ biến. Ngoài ra, môi trường sống của linh trưởng đang bị phá hoại bởi các hoạt động khai thác gỗ, chặt củi và khai thác đất nông nghiệp cũng đang làm suy giảm quần thể các loài linh trưởng. Hầu hết các quần thể đang trong tình trạng bị phân tán mảnh.

Mặc dù đã có thêm rất nhiều thông tin và kiến thức khoa học được bổ sung trong những năm gần đây về hệ thống phân loại, phân bố tình trạng bị đe dọa và cả sinh học, sinh thái về thú linh trưởng của Việt Nam nhưng thực tế vẫn cấp thiết tăng cường cho công tác bảo vệ nhằm bảo tồn sự tồn tại của các loài thú linh trưởng.

### Introduction

During the last decade the knowledge about Vietnam's primate fauna increased noticeable due to research work of national institutions and international organizations, and there is now regularly new information. Meanwhile the content and task of several research works changed already from simple

records on distribution to biological, ethological and ecological studies. But nevertheless there is still a lack of information on the occurrence of several species and their status. Many areas in Vietnam are not yet intensively surveyed and new findings can be also expected during further field work.

Another output of the intensified field work is more detailed information about threats to the wild populations in the regions of the country and to their current or future impact to the primate populations.

One important background for conservation activities is also the clarification of the systematic position of species and populations. A close involvement of genetic studies contributed to decipher several unclear positions of taxa and was helpful in the discovery and systematic classification of them.

The paper will give actual information about systematics, distribution, habitat preferences, threats and the national and international protection status. The threat categories in the Red Data Book of Vietnam are not synonymous with the categories in the IUCN Red List. There are only three categories used (Endangered, Vulnerable, Rare) what seems to be occasionally confusing if an endemic species listed by IUCN Red List "Critically Endangered" but on national level only "Endangered".

The paper should also reveal where are lacks of knowledge about the distribution, the systematic classification and a deficit in information about the threats.

## Primate taxa of Vietnam

### Pygmy loris (*Nycticebus pygmaeus*)



Pygmy loris is a monotypic species. Over the whole distribution area there are no phenotypic or genetic differences recognized. (Roos, 2004; Streicher, 2004). The description of the taxon *Nycticebus intermedius* (Dao Van Tien, 1960) was based on a lack of knowledge about the seasonal changes of fur coloration. Studies on fur pattern and genetics proved that this taxon is synonymized to *N. pygmaeus* (Roos, 2004; Roos *et al.*, 2007; Streicher, 2004).

This species is found east of the Mekong River in Vietnam, Eastern Cambodia, Laos, and in a small part in south-east Yunnan, in southern China (Duckworth, 1994; Fooden, 1996; Ratajszczak, 1998; Vu Ngoc Thanh, 2002; Zhang Yongzu *et al.*, 2002). It is found up to 1500 m asl (MacKinnon & MacKinnon, 1987). The western limit of distribution in Laos and Cambodia is uncertain, but it appears to be absent or at least naturally very scarce in the extreme west of the Mekong plain (Duckworth *et al.*, 1999).

The pygmy loris has a nocturnal and arboreal lifestyle and is mostly found in evergreen rainforests, semi-evergreen forests and secondary forests, but has also been observed in bamboo plantations (Groves, 1971; Fitch-Snyder & Vu Ngoc Thanh, 2002;).

In Vietnam, the species is heavily exploited for traditional medicine and the pet trade, including in international trade, at levels that are not sustainable. It is also used as a food source by many minorities (Streicher, 2004).

The pygmy loris is protected at the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Category: Vulnerable; Criteria: A2cd. Listed as Vulnerable as the species is believed to have undergone a decline of more than 30% over the last three generations (25 years, given a generation length of 8 years) due primarily to hunting, but also as a result of habitat loss. This species may warrant listing in a higher category of threat if it subsequently shown that the rate of decline is on the order of 50% (Southeast Asia Mammal Data Bank, 2006).

There is an application present to the CITES-secretariat to transfer this species from appendix II to appendix I in the CITES regulations.

### Northern slow loris (*Nycticebus bengalensis*)



The Bengal slow loris has only recently been recognized as valid species (Groves, 1998; Roos, 2004). Bengal slow loris is the largest of the *Nycticebus* species and can reach a head-body length up to 380 mm (Streicher, unpubl.).

This species is found from northeastern India, through Bangladesh, north Myanmar, north Thailand, south China (south Yunnan and south-west Guangxi) to Cambodia, Laos, and Vietnam (Duckworth *et al.*, 1999; Zhang Yongzu *et al.*, 2002).

The species is rare in Vietnam and in most of its distribution range the populations through high hunting pressure are probably already drastically reduced.

Very little is known about the habitat preferences of the species. There are records from evergreen and deciduous forests, but also from degraded and secondary forest and bamboo groves (Duckworth *et al.*, 1999; Nadler, unpubl.; U Tun Yin, 1967).

The slow loris is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Category: Vulnerable (VU) Criteria: A2acd+A3cd+A4acd. Due to loss of habitat over the last 20 years and due to severe pressures from hunting, there is more than 30% reduction in population over three generations. The species is predicted to decline by more than 30% in the next 20 years over its entire range due to continuing hunting pressures

and loss of habitat (Southeast Asia Mammal Data Bank, 2006).

In the CITES convention the species is currently listed as a subspecies of *N. coucang* in appendix II. The nomenclature committee proposes recognizing *N. bengalensis* as a full species.

### Stump-tailed macaque (*Macaca arctoides*)

The stump-tailed macaque has a wide distribution in Southeast Asia and is found in northern Myanmar, south China (south Yunnan, west Guangxi, south Guizhou), Vietnam, Laos, Cambodia (few records, one from west of the Mekong and only recently recorded from the east in Mondulkiri Province), Thailand and Malaysia (Duckworth *et al.*, 1999; U Tun Yin, 1967; Pfeffer, 1969; Walston *et al.*, 2001; Zhang Yongzu *et al.*, 2002).

This species has in Vietnam a wide habitat range from tropical evergreen forest to semi-deciduous, deciduous forest and limestone forest (Pham Nhat, 2002). In Cambodia and Laos the species is probably more restricted to evergreen and dense forests, though less common in the extreme lowlands (Duckworth *et al.*, 1999; Smith, 2001). In Myanmar it was found up to 2,100 m asl (U Tun Yin, 1967). In agricultural areas the macaques are sometimes crop raiders.

There are no population estimates available in Vietnam but the population is likely declining rapidly throughout its range through high hunting pressure (Pham Nhat, 2002). Trapping in many forest areas, including national parks and other protected areas has a major impact to the reduction of populations. Habitat disturbances that affect this species' survival include selective



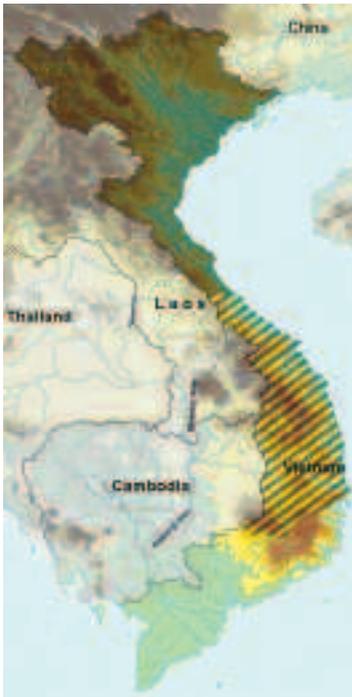
logging, timber and firewood collection, charcoal production, road, dam, power line buildings.

In Vietnam, the species is heavily targeted for traditional medicinal use, both in the country and for the trade to China. The hunting level for food is also very high. As more terrestrial species, it is more affected by snaring than other macaques (Duckworth *et al.*, 1999). Habitat loss is relatively a lower threat compared to hunting.

The species is protected in Vietnam on the second level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Category: Vulnerable (VU) Criteria: A4cd. Listed in this category due to the reduction in the past and projected in the future based on habitat loss and the high level of exploitation (Southeast Asia Mammal Data Bank, 2006). In the CITES convention the species is listed in appendix II.

### Rhesus macaque (*Macaca mulatta*)



The rhesus macaque has the largest distribution of the Southeast Asian macaque species. The species occurs in several subspecies from central and north India, north Pakistan, Kashmir, Afghanistan, Nepal, Sikkim, Bhutan to south-east China northwards to 36°N and southwards in Myanmar and Thailand to about 17°N in Laos and Vietnam to about 15°N (Zhang Yongzu *et al.*, 2002; Fooden, 1996; 2000). There are also introduced populations in areas within the region as well as outside (e.g. Cat Tien National Park, south Vietnam). Most of the records in Laos come from lower 600 m asl but the species was also observed at 850 m asl (Duckworth *et al.*, 1999).

A large hybrid zone exists between this species and *M. fascicularis* in central mainland Southeast Asia from southernmost Bangladesh through north Myanmar, north Thailand, central Laos and Vietnam (Fooden, 1996, 1997).

The Rhesus macaques resides in a range of habitats, including evergreen forest, deciduous and semi-deciduous forest, and limestone forest, also in bamboo and mixed forest, mangroves and shrub, and is restricted to forest areas where it is generally associated with riverine environments over a range of altitudes (Timmins, pers. comm.). Close to agricultural land the macaques are sometimes crop raiders (Pham Nhat, 2002).

The species is still widespread in north and central Vietnam but hunting for the traditional medicine and also as food has severely depressed the populations (Pham Nhat, 2002). The release of laboratory, farm, or confiscated animals into natural forests is a major threat to wild macaques. There is no information on population size available for Vietnam.

The species is protected in Vietnam on the second level under the wildlife protection law (Government of Vietnam, 2006), and not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Red List Category: Least Concern (LC) due to the widespread distribution in Southeast Asia (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.

### Assamese macaque (*Macaca assamensis*)

As an upland species the Assamese macaque occurs in mountainous areas south east of the Himalaya, from Nepal eastwards through Bhutan, northern Myanmar, north Laos, north Thailand, south China to north Vietnam. Groves (2001) recognized two subspecies, the nominate form

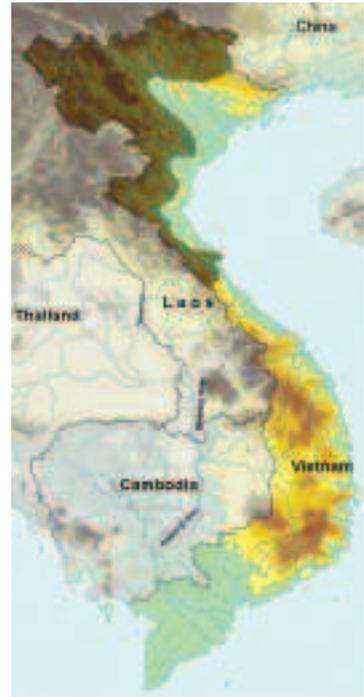
roughly about east of the Brahmaputra and *M. a. pelops* west of the Brahmaputra.

There are no population estimation available for Vietnam and even the distribution in Vietnam is not very clear yet. The southernmost area with confirmed records is Quang Binh Province (Timmins *et al.*, 1999; Pham Nhat, 2002).

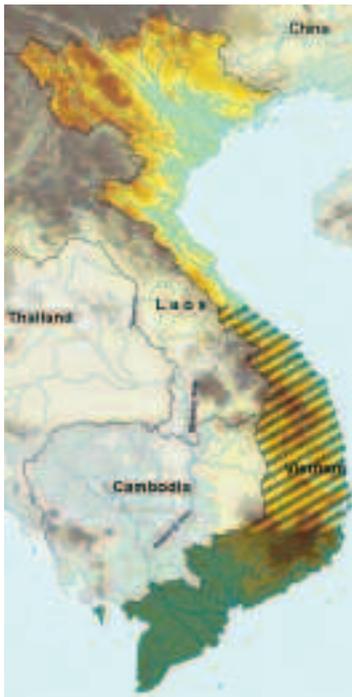
In Vietnam the species usually occur in dense evergreen primary forest, semi-deciduous forest and limestone forest (Pham Nhat, 2002), and not in secondary forest. It is usually associated with hill areas above 500 m asl. In forests on limestone karst, the species occurs also in lower elevations (Timmins *et al.*, 1999).

Hunting for food and as raw material for the production of traditional medicine, the monkey balm, is a major threat in Vietnam. The species is protected in Vietnam on the second level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Red List Category: Near Threatened (NT). The population has declined in Vietnam and Laos in the last 30-35 years by more than 30%, and is expected to continue in the future also. (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.



### Long-tailed macaque (*Macaca fascicularis*)



The long-tailed macaque is a very wide spread and variable species with several subspecies. For the nominate form are more than 30 names synonymized. Groves (2001) recognized eight subspecies. Found from eastern Bangladesh through Myanmar and southern Indochina to Borneo and Timor also throughout the Philippines. Present on many offshore islands. The species found on the Sunda Land up to more than 1,000 m asl. However, in Vietnam the distribution is restricted to the lowlands below 300 m asl.

The species is extremely tolerant of a range of habitats, including mangrove and swamp forests, evergreen, bamboo and deciduous forests, and can be found in agricultural areas near forest. (Fooden, 1991; Pham Nhat, 2002).

On mainland Southeast Asia, there is a wide hybrid zone with *Macaca mulatta* that makes it difficult to determine the northern limits of the range (s.a *Macaca mulatta*; Fooden, 1996, 1997). There are introduced populations in several areas outside its natural range in northern Vietnam (e.g. Cat Ba National Park, Pu Mat National Park, Pu Luong Nature Reserve).

The major threat to the species is hunting. Females are taken into breeding facilities and males are exported primarily for laboratory testing. There is of a lack of controlling which individuals are bred in farms and which individuals caught in the wild.

The species is protected in Vietnam on the second level under the wildlife protection law (Government of Vietnam, 2006), and not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Category: Least Concern (LC). The species is listed in this category in view of its wide distribution, presumed large population, tolerance of a broad range of habitats, occurrence in a number of protected areas and because it is unlikely to be declining at nearly the rate required to qualify for listing in a threatened category. Although the species is under heavy hunting pressure for meat, breeding facilities this is not considered a major threat to the species causing populations to decline (Southeast Asia Mammal Data Bank, 2006).

The endemic subspecies *Macaca fascicularis condorensis* has a restricted area on some islands belong to the Con Dao Archipelago in south Vietnam.

IUCN Red List Category: Vulnerable VU with the criteria D1, D2. The population is estimated at less than 1,000 individuals in total and it is despite the very limited range of the subspecies (the island is a national park) there are no obvious threats that would lead to the species declining very quickly (Southeast Asia Mammal Data Bank, 2006).

The CITES convention lists the species in appendix II.

### Northern pigtail macaque (*Macaca leonina*)



The former taxon *Macaca nemestrina* is now splitted into two species, the southern species *Macaca nemestrina*, and the northern species *Macaca leonina*. The southern pigtail macaque occurs roughly from the Isthmus of Kra on the Malay Peninsula south to Sumatra, Bangka and Borneo (Groves, 2001). The northern pigtail macaque *M. leonina* occurs from Myanmar eastwards through Thailand, Cambodia, Laos, and Vietnam. In Vietnam and Laos most records are as far north as 19°N but there are also records mentioned from Son La and Hoa Binh Provinces (Pham Nhat, 2002). In Yunnan Province, China the species occurs to about 26°N (Zhang Yongzu *et al.*, 2002).

This is a predominantly terrestrial species, although readily climbs and forages in the canopy. It occurs in tropical wet evergreen and semi-deciduous forest, coastal forest, swamp forest, limestone forest, and also in degraded forests. In Vietnam the species is associated with lowlands usually below 500 m asl (Pham Nhat, 2002).

In Vietnam hunting for food and trade is the primary threat, but as a predominately lowland species habitat loss likely is also a major threat to the species. Habitat disturbances that affect this species' survival include selective logging, timber and firewood collection, road building, and forest fragmentation.

The species is protected in Vietnam on the second level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science,

Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Category: Vulnerable (VU) Criteria: A4cd. The decline in the countries of occurrence is different, more than 30% in the last 30-35 years in India, Bangladesh, China, Vietnam and Myanmar. There are perceptible declines in Thailand, Laos and Cambodia, but the rate is close to or lower than 30%. In most of the countries, the species is predicted to decline at a rate higher than 30% over the next three generations (Southeast Asia Mammal Data Bank, 2006).

The CITES convention lists the species in appendix II.

### Francois' langur (*Trachypithecus francoisi*)

The Francois' langur occurs only in south China and northern Vietnam. In historical time it was wide spread over the northern provinces in Vietnam but poaching resulted in a dramatic decrease of the population which is now highly fragmented. There are recent records from Ha Giang, Cao

Bang, Tuyen Quang and Bac Kan Provinces (Nadler *et al.*, 2003, Pham Nhat, 2002; Le Khac Quyet, 2003). There is no recent record or evidence that the species still exist in Lang Son and Thai Nguyen Provinces.

The total population for Vietnam is estimated to less than 300 individuals, which occurs in about 10 subpopulations. No population contains more than 50 mature individuals (Nadler *et al.*, 2003).

The Francois' langur is a typical “limestone species” closely related to limestone areas with steep limestone outcrops (Nadler *et al.*, 2003; Qihai Zhou *et al.*, 2006; Ratajszczak *et al.*, 1990; Zhao Yuan Li, 2006). The animals utilize the cave formations and overhangs in these areas for shelter.

In Vietnam, and also in China, the major threat to this species is hunting, although some populations face pressures from limestone quarrying. Hunting mainly takes place for traditional medicine (Nadler *et al.*, 2003), and to a lesser degree for meat (feeding predominantly Chinese restaurant markets).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as “Vulnerable”.

IUCN Red List Category: Endangered (EN) Criteria: A2cd; C1+2a(i) with the reason of the fragmented and declining population (Southeast Asia Mammal Data Bank, 2006).

The CITES convention lists the species in appendix II.



### Delacour's langur (*Trachypithecus delacouri*)



The Delacour's langur is endemic to Vietnam. It occurs in a very restricted area of about 5000 square km, but the distribution areas of all isolated subpopulations cover together only about 400 square km. The species is also a typical “limestone species” and closely related to limestone mountain ranges in the Provinces of Ninh Binh, Ha Nam, Hoa Binh, Thanh Hoa, and Ha Tay (Nadler, 2004).

The total population is estimated to 200 to 250 individuals, surviving in 19 isolated subpopulations. The species is believed to be extirpated from three additional sites, and some important populations, including Cuc Phuong National Park and Pu Luong Nature Reserve have decreased by 20% in 5 years (2000 to 2004). Previous surveys (1995-1999) had estimated the population at between 281 and 317 individuals (Nadler, 2004). 60% of the total population occurs currently in subpopulations with less than 20 animals (Nadler, unpubl.).

The largest subpopulation exists in one part of Van Long Nature Reserve, Ninh Binh Province, and totals about 50 individuals.

Hunting is the primary threat facing this species. A potential threat is the rapid development of tourist facilities adjacent to protected areas and limestone quarrying (Nadler, 2004; Nguyen Van Thanh & Le Vu Khoi, 2006).

Delacour's Langurs have been successfully kept and bred

at the Endangered Primate Rescue Center at Cuc Phuong National Park with the goal to support wild populations through reintroduced groups of captive bred animals or to establish new populations in the wild where the species formerly occurred (Nadler, 2004).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Endangered".

IUCN Red List Category: Critically Endangered (CR) Criteria: C2a(i) with the reason that present populations doesn't exceed 50 mature individuals (Southeast Asia Mammal Data Bank, 2006).

The species is listed as one of the 25 world's most endangered primates (Mittermeier *et al.*, 2006). The CITES convention lists the species in appendix II.

### Hatinh langur (*Trachypithecus laotum hatinhensis*)



The Hatinh langur is very closely related to the Lao langur (*Trachypithecus l. laotum*) and therefore classified as a subspecies of *laotum* (Roos, 2004; Roos *et al.*, 2007). In respect to the allopatric distribution and by application of the phylogenetic species concept the taxon is recognized by Groves (2001) a distinct species. The taxonomic status of the black langur described by Brandon-Jones (1995) as subspecies *ebenus* of the Java langur *Trachypithecus auratus*, and recognized by Groves (2001) a distinct species *Trachypithecus ebenus* requires clarification. Based on two samples (including the type specimen) there is no genetic difference between black langurs and Hatinh langurs which resulted in the placement of the black langur as a morph of the Hatinh langur (Roos, 2004; Roos *et al.*, 2007). Field observation of mixed groups and intermediary shapes of the white cheeks support this view. But some observation reports also the occurrence of black langurs close and in mixed groups with Laos langurs (Duckworth *et al.*, 1999; Robinson & Webber, 1999), although there is a clear genetic difference between *hatinhensis* and *laotum* (Roos, 2004). Based on the molecular genetic of the type specimen we recognize the black langur as a morph of the Hatinh langur. There is a need for further surveys and taxonomic research to resolve the status of this form.

The Hatinh langur is another species of the "limestone langur"-group which occurs in northern Vietnam and southern China. Although the historical range of this species may once have been

more extensive, it seems to be currently restricted to limestone areas in the western part of Quang Binh and Quang Tri Provinces, and, to a lesser extent, in the eastern part of Khammouan Province in Lao PDR (BirdLife International, 2005; Duckworth *et al.*, 1999; Nadler *et al.*, 2003). The western limit of the range of the species in Laos is unclear. The overlap zones of this species with *T. ebenus* (or another black langur taxon) is not well defined (Duckworth *et al.*, 1999; Timmins, pers. comm.).

The Phong Nha-Khe Bang area has the largest remaining population of the species (Nadler *et al.*, 2003; Pham Nhat, 2002). Although a large area of suitable habitat remains in Phong Nha-Ke Bang the density appears low (Nadler *et al.*, 2003). Based on interviews and field observations, Pham Nhat (2000) estimated a maximum of 800 individuals. However, large parts of the area are not easy to survey due to difficult accessible terrain, and likely the size of this population is underestimated.

The main threat to this species is hunting. A predominant hunting method is to close at night the sleeping cave in a limestone cliff with a net after the langurs moved in, and the whole group can be caught inside the cave (Nadler *et al.*, 2003). The animals are killed mostly for traditional medicine. There is an ongoing captive-breeding program for this species in the Endangered Primate Rescue Center at Cuc Phuong National Park under supervision of Frankfurt Zoological Society and a

reintroduction project on the way in Phong Nha - Ke Bang National Park.

The Hatinh langur is protected on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as “Endangered”.

IUCN Red List Category: Endangered (EN) Criteria: A2cd. The species is likely to have undergone a decline of more than 50% over the last three generations (35 years) due to the ongoing loss and decline of habitat and effects of hunting (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.

The black langur is not explicit mention in the Vietnamese law but as a morphe of the Hatinh langur it has the same protection status as the species on the highest level under the wildlife protection law (Government of Vietnam, 2006).

IUCN Red List recognize species level for the black langur and place the taxon in the category: Vulnerable (VU) Criteria: A3cd+A4cd with the reason of a projected decline of more than 30% over the next three generations (35 years) due to the ongoing loss and decline of habitat and effects of hunting (Southeast Asia Mammal Data Bank, 2006). Under the recognition as morphe of the Hatinh langur it's listed in the CITES convention in appendix II.

### Cat Ba langur (*Trachypithecus poliocephalus poliocephalus*)



The Cat Ba Langur is morphologically and genetically closely related to the Chinese white-headed langur (*T. poliocephalus leucocephalus*) and hence recognized as the nominate form of these two langurs.

Only found on Cat Ba Island, north-east Vietnam, this langur has the smallest distribution of all langur species, and is restricted to about a 100 square km area of occurrence, mostly inside Cat Ba National Park (Nadler & Ha Thang Long, 2000; Stenke, 2004). This species is also belongs to the “limestone-langur”-group, and is associated with forests on karst hills.

The population size is 64 individuals (August 2006) (Stenke, pers. comm.), and decreased from 104 - 135 individuals in 2000 (Nadler & Ha Thang Long, 2000). The whole population is fragmented into seven isolated subpopulations. An estimation of the population for the beginning of the 20. century - before hunting reduced the population dramatically - is made to 2,400-2,700 individuals on Cat Ba Island (Nadler & Ha Thang Long, 2000).

Poaching for the use in traditional medicine, has been recognized as the most severe threat to Cat Ba langurs, and is the reason for the precipitous decline in their population in the past couple decades. Fragmentation and habitat disturbance resulting from the growing human population on Cat Ba Island, and the inconsiderate and reckless tourist development and their inadequate management is currently the major threat. Forest fire on the limestone cliffs due to honey collectors has a

high impact to the habitat.

The Cat Ba langur is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as “Endangered”.

The IUCN Red List recognize the taxon as monotypic species with the category: Critically Endangered (CR) Criteria: A2cd. A decline > 80% has been observed in the last 35 years (generation length: 12 years) (Southeast Asia Mammal Data Bank, 2006). The species is listed as one of the 25 world's most endangered primates (Mittermeier *et al.*, 2006). The CITES convention lists the species in appendix II.

### Grey langur (*Trachypithecus crepusculus*)



This taxon was formerly classified as a subspecies of the Phayre's langur as *Trachypithecus phayrei crepusculus*. But despite similarities in coloration the taxon is genetically more closely related to the *francoisi*-langur group than to the Phayre's langur (Roos, 2004).

The species is found from central and north-west Thailand north to Yunnan in China east to south-west Laos and northern Vietnam, and west to the coast of the Bay of Bengal, south of the range of the Phayre's langur (Groves, 2001). Information about the western limit of the distribution are not reliable, based on the confusion with the Phayre's langur and the recent split of the taxonomic position.

There are only few reliable records from northern Vietnam during the last years (Nadler *et al.*, 2003) and there are also fewer records than from all other primate species in Laos (Duckworth *et al.*, 1999)

The species prefers primary and secondary evergreen, semi-evergreen forest, and mixed moist deciduous forest. In Laos (Duckworth *et al.*, 1999) and in Vietnam (Pham Nhat, 2002) it also occurs in limestone forest. The major threat is hunting for traditional medicine.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), but under the synonyms *Trachypithecus barbei* and *T. phayrei*, and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

The IUCN Red List recognize the taxon under *Trachypithecus phayrei* in the category: Endangered (EN) Criteria: A2cd. It is believed to have undergone a decline of more than 50% over the last three generations (35 years, given a generation length of 12 years) due to a combination of habitat loss and hunting (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.

### Indochinese silvered langur (*Trachypithecus germaini*)

With a comprehensive collection of samples from the whole distribution area of the silvered langurs the molecular genetic shows a clear differentiation of taxa on species level within the region (Nadler *et al.*, 2005). For the mainland Southeast Asia are two species recognized. The genetic evidence suggests that silvered langurs east of the Mekong, named as Annamese silvered langur, *Trachypithecus margarita*, are distinct from that west of the Mekong, classified as Indochinese silvered langurs, *Trachypithecus germaini* (Nadler *et al.*, 2005). The precise limits of the distribution range between these species need more investigation.

Indochinese silvered langurs are recorded in Vietnam only in Kien Giang Province, south of the Mekong. In this area exist several isolated populations mostly on limestone blocks with degraded forest cover.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006),



but under the synonymy *Trachypithecus villosus* and *T. cristatus*. No silvered langur taxon is listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Category: Endangered (EN) Criteria: A4cd. This species has declined significantly and is only locally abundant in Cambodia. A decline on 50% due to 70-80% habitat loss and hunting pressure give the reason for this category (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.

### **Annamese silvered langur (*Trachypithecus margarita*)**



The Annamese silvered langur has a wide distribution east of the Mekong in Cambodia, south Laos and south and central Vietnam. In Vietnam, the southern limit is Dong Nai Province and the northern limit is Quang Tri Province.

The apparently extremely low density of this species in Vietnam suggests that the population has been seriously reduced due to human pressure. In Vietnam, there are only a few sightings documented in the last 50 years, though this may be also a result of limited surveys conducted in the species range (Nadler *et al.*, 2003).

The Annamese silvered Langur is primarily a lowland species, found in evergreen and semi-evergreen forest, mixed deciduous forest, and riverine and gallery forest. Records in hilly areas or at higher elevations are a few.

Hunting, mainly for subsistence use, traditional medicine is a major threat to this species, as is habitat loss mainly due to agricultural expansion.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), but under the synonymy *Trachypithecus villosus* and *T. cristatus*. No silvered langur taxon is listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

This species is not listed separately from the Indochinese silvered langur and hence it has the same protection status, and assessment. IUCN Red List Category: Endangered (EN)

Criteria: A4cd. This species has declined significantly and is only locally abundant in Cambodia. A decline on 50% due to 70-80% habitat loss and hunting pressure give the reason for this category (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix II.

### **Red-shanked douc langur (*Pygathrix nemaeus*)**

The red-shanked douc langur occurs in central Laos, and northern central Vietnam. In Laos occur the core population of the species and is much more stable than that in Vietnam, after several decades of intense human pressure. In Vietnam the species occur from Nhe An Province in the north to Kon Tum Province in central Vietnam (Nadler *et al.*, 2003). The species has a very small hybridisation zone with the grey-shanked douc langur (*P. cinerea*) in the northern part of Quang Nam Province. Areas of sympatry, where interbreeding between species of this genus may occur, are limited (Vu Ngoc Thanh and Ha Thang Long, pers. comm.).

This species occurs in primary and secondary evergreen forest, semi-deciduous forest and also in limestone forest (Pham Nhat, 2002).

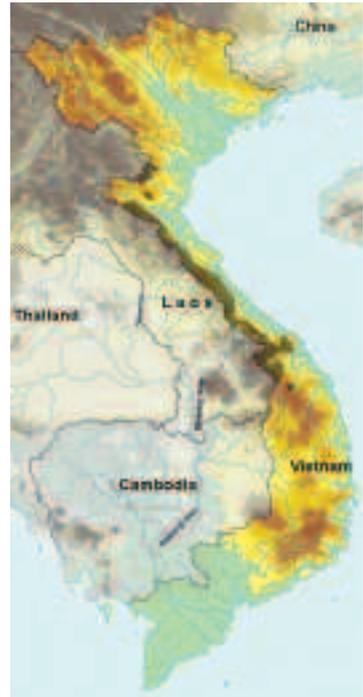
Hunting is currently the major threat to this species, most often for subsistence use and traditional medicine, and also sometimes for the international pet trade, especially from Laos to Vietnam and Thailand (Timmins & Duckworth, 1999; Nadler *et al.*, 2003). Zoos in China purchase also animals from the illegal trade (Nadler, unpubl.). Destruction of its natural habitat is also a threat to this species, a large portion in the central part of Vietnam has suffered from post-war human

demographic explosion and extensive logging for coffee, rubber, and cashew plantations. The translocation of some 3 million people from the north of Vietnam to the central highlands is likely to exacerbate rates of habitat loss through the Vietnamese range of the species (Nadler *et al.*, 2003).

There is an ongoing captive-breeding program for this species at the Endangered Primate Rescue Center at Cuc Phuong National Park under the supervision of the Frankfurt Zoological Society for further reintroduction.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Endangered".

IUCN Red List Category: Endangered (EN) Criteria: A2cd+A4cd. The species is believed to have undergone a decline of more than 50% in the last three generations (35 years, based on a generation length of 10-12 years) due to forest loss and hunting (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.



### Grey-shanked douc langur (*Pygathrix cinerea*)



The grey-shanked douc langur is genetically closely related to the red-shanked douc langur but based on morphological and molecular genetic differences the taxon is recognized as distinct species (Groves, 2001; Roos, 2004; Roos & Nadler, 2004).

The grey-shanked douc langur occurs in central Vietnam from Quang Nam Province in the north to Binh Dinh and Gia Lai Provinces in the south. (Nadler *et al.*, 2003; Ha Thang Long, 2004). On the northern limit exists a small hybridization zone with the red-shanked douc langur. The total population is estimated to a maximum of about 800 individuals (Ha Thang Long, 2004). But there are still surveys necessary to proof some more areas. The southern limit of the distribution is still to clarified. The southernmost provisional report was made from Cu Jut District, Dak Lak Province but is not confirmed in the field yet (Ha Thang Long & Le Thien Duc, 2001).

This species occurs in evergreen and semi-evergreen primary forest but also in highly degraded forest (Ha Thang Long, 2004; Nadler, unpubl.).

The Central Highland where this langur occur lose almost 10,000 ha of forest annually due to logging and agricultural conversion. This creates a more and more fragmented habitat and population structure (Ha Thang Long, 2004). The species suffer also from high hunting pressure for food, traditional medicine, and

for sale as pets (Ha Thang Long, 2004). But a douc langur as pet has, with the highly sensitive digestion system, mostly not a chance for long survival.

There is an ongoing captive-breeding program for this species in the Endangered Primate Rescue Center at Cuc Phuong National Park under supervision of Frankfurt Zoological Society with the goal of further reintroduction.

The species is protected in Vietnam on the highest level under the wildlife protection law

(Government of Vietnam, 2006). The species is not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Category: Critically Endangered (CR) Criteria: A2cd+A4cd. The species has undergone more than an 80% population reduction across much of its range due to increasing human activities (agriculture and hunting) (Southeast Asia Mammal Data Bank, 2006). The species is listed as one of the 25 world's most endangered primates (Mittermeier *et al.*, 2006). The CITES convention lists the species in appendix I.

### **Black-shanked douc langur (*Pygathrix nigripes*)**



The species is found in north-east Cambodia, only east of the Mekong and in southern Vietnam. In Vietnam it occurs from Dak Lak Province in the north southwards to Dong Nai Province. Records from northernmost Kon Tum Province are questionable and need to be confirmed. There is probably a confusion with the occurrence of grey-shanked douc langurs. A sympatric distribution with the grey-shanked douc langur is not confirmed.

There is no population estimate for Vietnam. The largest population in Vietnam may be in Nui Chua National Park (Ninh Thuan Province) which is estimated at 500-700 individuals (Hoang Minh Duc & Ly Ngoc Sam, 2005). The population in Nam Cat Tien National Park numbers at about 100 individuals. (Phan Duy Thuc *et al.*, 2005).

Black-shanked doucs are found in evergreen, semi-evergreen and mixed deciduous forests, as well as in coastal dry forest. It seems that species of this genus can adapt to relatively heavily disturbed forest (Nadler *et al.*, 2003).

Hunting is currently the major threat to this species. It is most often hunted for meat and traditional medicine. Destruction of its natural habitat is also a threat to this species, a large portion in the central and south of Vietnam suffered human demographic explosion and extensive logging for coffee, rubber, and cashew plantations. Most forest at lowland elevations has been cleared and little forest remains undisturbed (Ha Thang Long & Le Thien Duc, 2001; Nadler *et al.*, 2003).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Vulnerable".

IUCN Red List Category: Endangered (EN) Criteria: A2cd. The species is believed to have undergone a decline of more than 50% in the last three generations (35 years, based on a generation length of 10-12 years) due to forest loss and hunting (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.

### **Tonkin snub-nosed monkey (*Rhinopithecus avunculus*)**

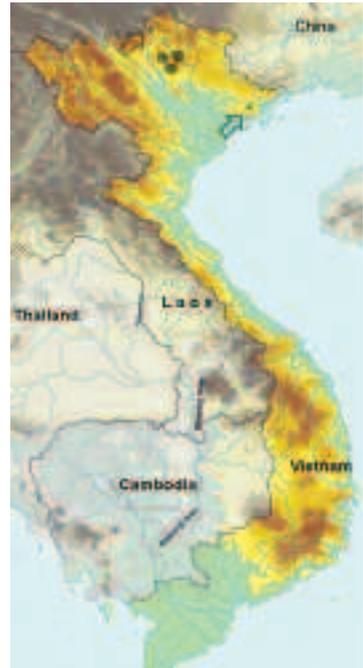
The Tonkin snub-nosed monkey is one of four unusual, large Asian colobine monkeys of the genus *Rhinopithecus*, all of which possess a characteristic turned-up nose. The three other species are endemic to China, while the Tonkin snub-nosed monkey is endemic to northern Vietnam.

Historically the species was distributed over a relatively large area in northern Vietnam east of the Red River. Due to massive deforestation and intensive hunting in recent decades, its distribution has become dramatically restricted. Now it occurs only in Tuyen Quang and Bac Kan Provinces and to a lesser extent in Ha Giang Province (Nadler *et al.*, 2003). Former information about the occurrence in Tuyen Quang and Quang Ninh Provinces are recently not confirmed (Le Khac Quyet, pers. comm.).

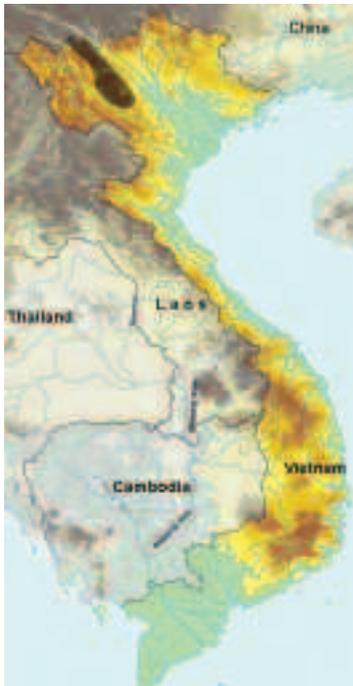
Currently, there are only four known locations with recent evidence where Tonkin snub-nosed monkeys occur, and these are completely isolated. For the subpopulation in Na Hang Nature Reserve (Tat Ke sector), Tuyen Quang Province a study in 2004-2005 have been estimated only 17-22 individuals. No recent information is available from the other isolated part of Na Hang Nature Reserve (Ban Bung sector). A population of about 70 individuals was estimated for Cham Chu Nature Reserve, Tuyen Quang Province in 2001 (Long & Le Khac Quyet, 2001) but a survey in 2006 provided no sightings and no reliable evidence of the survival of the population. Local reports indicate, however, a small group of 8-12 individuals still in the area (Dong Thanh Hai *et al.*, 2006). A population of about 60-90 individuals was discovered 2001 in Khau Ca, close to Du Gia Nature Reserve, Ha Giang Province (Le Khac Quyet, 2004). This is the only population which is not immediately threatened. The total population of the Tonkin snub-nosed monkey is estimated not to exceed 150 individuals.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Endangered".

IUCN Red List Category: Critically Endangered (CR) Criteria: C2a(i). Basis for the classification is the observed and ongoing dramatical population decline, and the small populations of mature individuals estimated less than 50 individuals (Southeast Asia Mammal Data Bank, 2006). The species is listed as one of the 25 world's most endangered primates (Mittermeier *et al.*, 2006). The CITES convention lists the species in appendix I.



### Western black gibbon (*Nomascus concolor*)



The western black gibbon is a monotypic species. The molecular genetic shows no differences between all described subspecies (Roos *et al.*, 2007).

The species occurs in north Laos, southern part of Yunnan Province, China and northern Vietnam between Black and Red River in the provinces Lao Cai, Yen Bai, and Son La.

The largest and most important populations are located in the districts Van Ban, Mu Cang Chai and Muong La in the south of the Hoang Lien mountain range. In total there exist probably less than 150 individuals, with less than 50 mature animals (Tallents *et al.*, 2000a; 200b; 2001; Le Trong Dat *et al.*, 2001; 2005).

The biggest threats to the gibbons throughout its range include hunting and destructive forest use; mostly it's ultimately always a combination of the both (Geissmann *et al.*, 2000; Ngo Van Tri & Long, 1999). Despite a gun collection (1800 guns have been collected in only 3 communes!) there is still hunting in the area and nearly daily gun shots were heard during a survey (Le Trong Dat *et al.*, 2005).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Endangered".

IUCN Red List Category: Critically Endangered (CR) Criteria: A2cd, because there is an estimate of over 80% decline in the last 45 years (3 generations) (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.

### Eastern black gibbon (*Nomascus nasutus*)



Recent molecular genetic studies have determined a clear difference on species level between the allopatric populations of Hainan Island and on the mainland (Roos *et al.*, 2007), and hence the Chinese Hainan gibbon is classified as *Nomascus hainanus*. Also the vocalization supports a separation on species level (Geissmann, pers. comm.).

The eastern black gibbon occurs only in a very small area in northeast Vietnam close to the Chinese border, in Trung Khanh District, Cao Bang Province. There is a recent information about a small relict population with 17 individuals adjacent to the area in Vietnam in Bangliang forest area of Jingxi County, Guangxi Province, China (People's Daily Online, 2006). There is no recent evidence that in Vietnam eastern black gibbon populations still exists where historically the species occurred, in Bac Kan and Thai Nguyen Provinces (Geissmann *et al.*, 2000).

The population in Phong Nam-Ngoc Khe forest in Trung Khanh District was discovered in 2002 (La Quang Trung & Trinh Dinh Hoang, 2001; 2004). A provisional record was made in 1999 in Kim Hy Nature Reserve but without evidence that the species still exists in the area (La Quang Trung & Trinh Dinh Hoang, 2004).

The highest number recorded of this species in Vietnam has been 37 individuals (Trinh Dinh Hoang, 2004). In 2005 27 individuals in 6 groups have been confirmed inside the Phong

Nam-Ngoc Khe proposed Species/Habitat Conservation Area. Two additional groups with about 8 individuals are mentioned outside the surveyed area (Vu Ngoc Thanh *et al.*, 2005).

The location with the last remaining population of the eastern black gibbon, the Phong Nam-Ngoc Khe proposed Species/Habitat Conservation Area, is a typical karst area with limestone forest but widely degraded by human activities. Currently only about 700 ha of forest is in a good condition (Vu Ngoc Thanh *et al.*, 2005). Due to the limitation of its habitat, the gibbon groups are concentrated in an area of 400 ha in the center of the proposed nature reserve.

At present, hunting pressure is not particularly high. Timber logging and charcoal production are low. A major threat to the proposed nature reserve is fuel wood collection, non-timber forest product collection and agricultural activities in the valleys. In addition, local people often graze cattle and livestock inside the proposed nature reserve and allow their dogs to run free. This is a major disturbance to the wildlife (Vu Ngoc Thanh *et al.*, 2005).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006) but not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

The IUCN Red List treat the Hainan gibbon and eastern black gibbon as subspecies to *N. nasutus* and classified in the Category: Critically Endangered (CR) Criteria: A2acd; B1ab(iii,v); C2a(i,ii); D1. The species is threatened from problems intrinsic to extremely small population size such as inbreeding effects, poor mate-choice, and human or natural disaster (Southeast Asia Mammal Data Bank, 2006). The species is listed as one of the 25 world's most endangered primates (Mittermeier *et al.*, 2006). The CITES convention lists the species in appendix I.

### Northern white-cheeked gibbon (*Nomascus leucogenys leucogenys*)



The northern and the southern white-cheeked gibbons are molecular genetically closely related, and hence they are classified as subspecies to the species *N. leucogenys* (Geissmann *et al.*, 2000; Roos, 2004). Despite the close relationship also in vocalization as another important feature for the taxa identification in gibbons placed Groves (2001) both taxa on species level.

The northern white-cheeked gibbon occurs in north Laos, northwest and northern central Vietnam. In China, the taxon was previously reported in Xishuangbanna National Nature Reserve, south Yunnan Province (Zhang Yongzuo *et al.*, 2002) but is now most probably extirpated (Bleisch, pers. comm.).

In Vietnam this gibbon was recorded west and south of the Black River. It has been extirpated from several areas from which it was previously recorded and is now only known from a few localities in northwest, Lai Chau Province, and northern central Vietnam, Thanh Hoa and Nhe An Provinces (Geissmann *et al.*, 2000).

The population in Vietnam is extremely low and highly fragmented. Geissmann *et al.* (2003) recorded 27 sites at which this species should have occurred, but it was only confirmed surviving at four, and may be survived in a further three. In Pu Huong Nature Reserve, the number of groups remaining is less than 10, while in Pu Hoat Nature Reserve - both reserves in Nghe An Province - fewer than three groups survive (Nguyen

Manh Ha, 2005). Most probably no population exists anymore with more than 50 individuals.

Hunting for traditional medicines and for the pet trade is the major threat across the range, and is the primary cause for the decline of the populations. Despite the gibbons exist in evergreen primary and also heavily degraded evergreen and semi-evergreen forests the forest fragmentation through agricultural encroachment into mountainous areas, fuel-wood, and timber extraction support the isolation of individuals and poaching.

The species is the most common species of *Nomascus* maintained in zoos, but nothing whatever is known about it in the wild.

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), and listed in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000) as "Endangered".

IUCN Red List Category: Critically Endangered (CR) Criteria: A2cd+A3cd. The taxon is placed in this category based on the drastic population reduction occurred and ongoing, due mainly to habitat loss and hunting pressure (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.

### Southern white-cheeked gibbon (*Nomascus leucogenys siki*)

The southern white-cheeked gibbon occurs in south Laos and central Vietnam. The northern limit of the distribution in Vietnam is in Nghe An Province by about 19°N. The southern limit of the distribution is not clear because there is probably a contact or hybridization zone with the yellow-cheeked gibbon (*N. gabriellae*) between Quang Tri Province and the northern part of Kon Tum Province.

The habitat of the species is heavily fragmented due to logging and agricultural encroachment, and a high population density of humans continues to threaten this species' habitat and population numbers.

There are no available population estimates for Vietnam. The most important populations are in

Phong Nha-Ke Bang and Pu Mat National Parks (Nguyen Manh Ha, 2005). In Pu Mat National Park the population are believed to have declined in six years (1999 to 2004) about 40% (Grieser Johns, 2004). A relatively large population exists in Dak Rong Nature Reserve, Quang Tri Province, with a minimum of 25 groups (Nguyen Manh Ha, 2004). But the systematic status of gibbons in this area still requires clarification.

The gibbons are primarily occur in tall primary evergreen forest. Habitat fragmentation through logging and agricultural encroachment has a high impact to the populations, but hunting is the major threat for the population decline. The species is used in traditional medicine, as food, and in the pet trade (Geissmann *et al.*, 2000).

The southern white-cheeked gibbon is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006), but not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Category: Endangered (EN) Criteria: A2cd. The reason for the classification is the occurred and ongoing population reduction due to habitat loss and hunting pressure (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.



### Yellow-cheeked gibbon (*Nomascus gabriellae*)



The yellow-cheeked gibbon is distributed in north-east Cambodia, and southern Vietnam. There occurs probably also a population far south in Laos but their taxonomic position needs to be clarified (Duckworth *et al.*, 1999).

The southern limit of the distribution in Vietnam is Dong Nai Province. The northern limit is not clear because of the confusion with the southern white-cheeked gibbon (*N. leucogeny siki*) and possible interbreeding. Kon Tum Province is probably the northern limit where pure *N. gabriellae* is doubtless to identified.

There is no population estimate for Vietnam but it is likely that this species is the most common of the crested gibbons in Vietnam.

In Nam Cat Tien National Park, Dong Nai Province has been estimated at about 500 individuals in 150 groups. Other important populations hold Bu Gia Map and Nui Chua National Parks. The Lam Dong Plateau seems to support a relatively large population of this species (Bricke *et al.*, 1998; Geissmann *et al.*, 2000).

The species is found in tall evergreen and semi-evergreen forest, probably ranges into other forest types (e.g., mixed bamboo and woodland forest) adjacent to these; they may also occur in riverine and gallery forest associations.

The major threat in Vietnam is hunting for the pet trade. Areas in southern Vietnam have been heavily degraded by defoliant spraying during the war time, agricultural encroachment, and logging, yet this species appear to survive in moderately disturbed forest, as suggested by its continued presence in Cat

Tien National Park and Dak Uyn State Forest Enterprise (Geissmann *et al.*, 2000).

The species is protected in Vietnam on the highest level under the wildlife protection law (Government of Vietnam, 2006) but not mentioned in the Red Data Book of Vietnam (Ministry of Science, Technology and Environment, 2000).

IUCN Red List Category: Endangered (EN) Criteria: A4cd. There is a need for close monitoring of this species since, given predicated likely rates of both habitat loss and hunting in the future, this species could well warrant listing in a higher category of threat (Southeast Asia Mammal Data Bank, 2006). The CITES convention lists the species in appendix I.

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