



NDF WORKSHOP CASE STUDIES
WG 5 – Mammals
CASE STUDY 5
Macaca fascicularis
Country – **CHINA**
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CITES NON-DETRIMENTAL FINDING CASE STUDY FOR THE EXPORTING CRAB-EATING MACAQUES (*MACACA FASCICULARIS*) FROM CHINA

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I. BACKGROUND INFORMATION ON THE TAXA

1. BIOLOGICAL DATA

1.1. Scientific and common names

Scientific name: *Macaca fascicularis* (Raffles, 1821).

Common name: Crab-eating macaque or long tailed macaque.

Chinese name: Shixiehou, translated from Crab-eating macaque?.

1.2. Distribution

Macaca fascicularis is native to Bangladesh, Brunei Darussalam, Cambodia, India (Andaman Is., Nicobar Is.), Indonesia, Malaysia, Myanmar, Palau, Philippines, Singapore, Thailand and Viet Nam. *Macaca fascicularis* as an introduced species has established populations in Hong Kong and Mauritius (IUCN 2007).

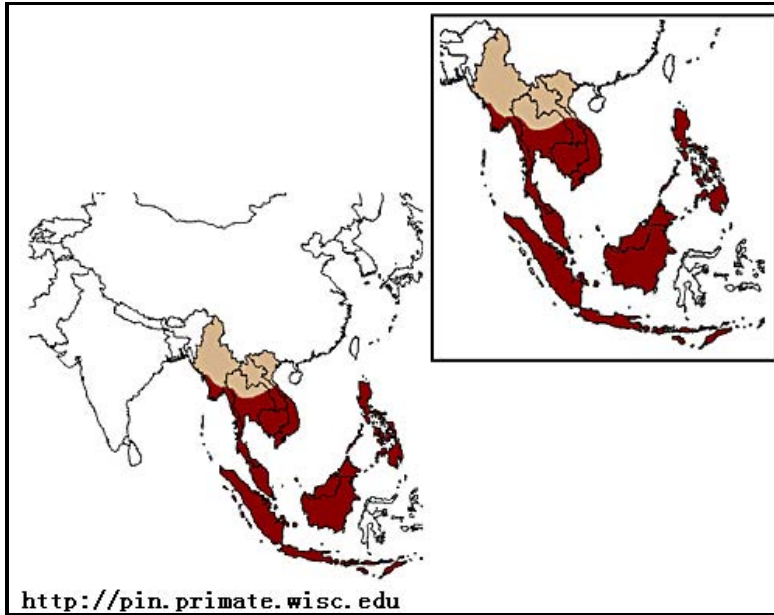


Figure 1 Distribution of *Macaca fascicularis* in the world.

1.3. Biological characteristics

1.3.1. Summary of general biology

Macaca fascicularis is a social animal that lives in troops from 5 to 60+ animals. These troops are multi-male groups, normally containing 2-5 males and 2-3 times as many females in strict dominance hierarchy. After a gestation period of 167-193 days, the female normally gives birth to one infant. Males reach sexual maturity at approximately 5-6 years of age and are likely to emigrate at or near that time to find and to settle down in another troop, whereas females mature at about 4 years of age and mostly choose to stay in their birth group. Crab-eating macaques are primarily frugivory but have an omnivory diet, and exploit many different food types, such as fruits, crabs, flowers, insects, leaves, fungi, grasses and clay, reflecting the diversity of habitats the macaque utilizes (Groves, 2005).

1.3.2. Habitat types

Macaca fascicularis is "ecologically diverse." Some of the habitats in which they have been found are primary forests, disturbed and secondary forests, and riverine and coastal forests of nipa palm and mangrove. However, *Macaca fascicularis* lives most successfully in disturbed habitats and on the periphery of forests (Groves, 2005).

1.3.3. Role of the species in its ecosystem

Crab-eating macaques are opportunistic mammals and reach higher densities in degraded forested areas, including habitats highly distur-

bed by humans. The macaques may negatively impact biodiversity by eating the eggs and chicks of endangered forest birds. They also compete with native birds for resources such as native fruits. On the hand, the crab-eating macaques facilitate the dispersal of seeds of exotic plants. Crab-eating macaques raid on sugar cane and other crops, affecting agriculture and livelihoods of those villagers who live near habitat of crab-eating macaques, and the macaques can be aggressive towards humans. Crab eating macaque is listed in "100 of the world's worst invasive alien species" by Invasive Species Specialist of IUNC (IUCN, 2008). Crab-eating macaques may carry potentially fatal human diseases, including B-virus.

1.4. Population:

1.4.1. Global Population size

Macaca fascicularis is the primate species with the third largest range after human and rhesus monkey. Although the estimation of its global population has not been reported, *Macaca fascicularis* is abundant in its core ranges according to reports (Groves, 2005). For instances, *Macaca fascicularis* was described as abundant in part of Malaysia, Thailand, and Indonesia. According to the Wildlife Department's of Malaysia statistics, there are 742,000 *Macaca fascicularis* in the country, of which 258,000 are found in city areas, including Kuala Lumpur¹. Considering the growing captive population of *Macaca fascicularis* in breeding facilities, world *Macaca fascicularis* population is stable or increase.

1.4.2. Current global population trends:

increasing decreasing stable unknown

1.5. Conservation status

1.5.1. Global conservation status (IUCN Red List: LR/nt ver 2.3 (1994)):

Critically endangered Near Threatened
 Endangered Least concern
 Vulnerable Data deficient

1.5.2. National conservation status for the case study country

As a species listed in CITES Appendix ?, *Macaca fascicularis* although an exotic animal, is automatically granted the Class II Key Stat Protected

¹ The Sydney Morning Herald. Saturday August 18, 2007

Wild Animal Species status under Wild Animal Protection Law of the People's Republic of China (P. R. China). Import, export, breeding, and transportation of crab-eating macaque should first obtain permits from wild management departments of the government. For importing and exporting crab-eating macaques, the permits are also required by national CITES authorities in China.

1.5.3. *Main threats within the case study country*

- No Threats
- Habitat Loss/Degradation (human induced)
- Invasive alien species (directly affecting the species)
- Harvesting [hunting/gathering]
- Accidental mortality (e.g. Bycatch)
- Persecution (e.g. Pest control)
- Pollution (affecting habitat and/or species)
- Other _____
- Unknown

Macaca fascicularis exported from the country are crab-eating macaques of generations lower than second generation bred in primate breeding bases.

2. SPECIES MANAGEMENT WITHIN THE COUNTRY FOR WHICH CASE STUDY IS BEING PRESENTED

2.1. Management measures

2.1.1. *Management history*

Before 1980s, domestic experimental primates in the country were mostly rhesus monkey, *Macaca mulatta*. China ratifies CITES in 1982. During early 1980s, since implication open-up and market economy reform in China, the cross-border trade was booming in the country. As a result of CITES enforcement, illegal trades of the crab-eating monkeys were detained and seized along the international border trade posts in southern China. Those macaques all were sent to local wildlife rescue centres. Comparing with rhesus monkey, crab-eating monkey is easier to breed in captivity; those confiscated macaques formed the initial founder populations of crab-eating monkeys in China. Late 1980s, the international demands for primate as laboratory animals increased. Around 1990, for breeding *Macaca fascicularis*, four primate breeding companies were established. The founder animals mostly came from the crab-eating macaques kept at those local wildlife rescue centers with the breeding stocks supplemented from primate breeding centers in Southeast Asia. Mounting demands in interna-

tional market for crab-eating monkey greatly stimulated the breeding of crab-eating macaques in the country. In August 2008, there are 40 primate breeding companies in the country, which keep about 170,000 crab-eating macaques mainly for the export and to meet the growth of demand for experiment animals worldwide. For standardizing the feeding standard of *Macaca* as laboratory animals, the State Forestry Administration (SFA) of P. R. China also formulized the Feeding Standards of *Macaca* as Laboratory Animals in 2005.

From 2004 to 2007, China imported 36,620 crab-eating macaques, and exported 12,244 crab-eating macaques. All macaque trades are with CITES permits and come from captive populations.

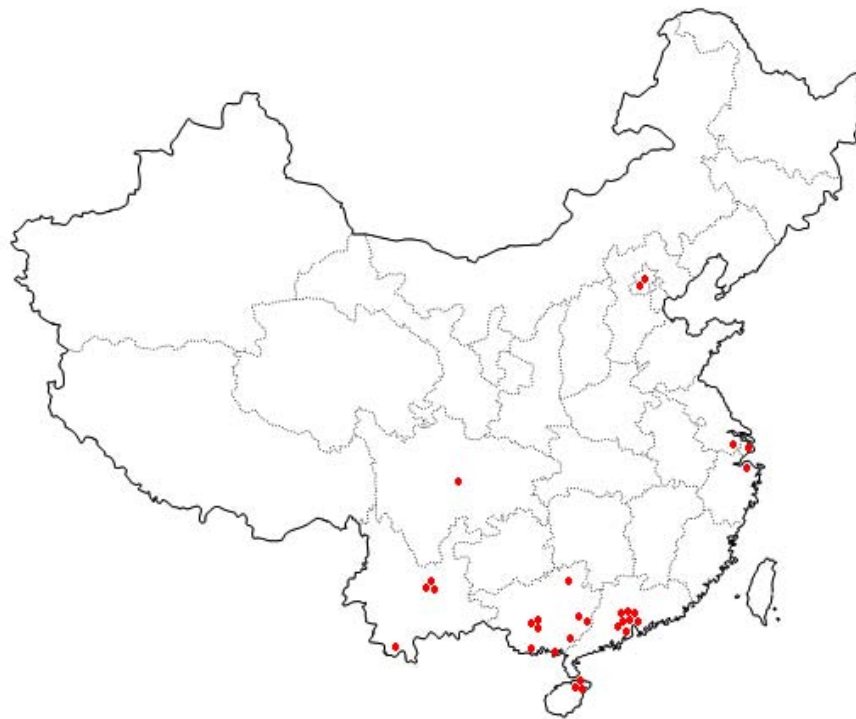


Figure 2 Major *Macaca fascicularis* breeding companies in China

To manage the growing crab-eating monkey breeding business in the country, China national wildlife authority (Wild Fauna and Flora Conservation Department, SFA) and national CITES authorities (The Endangered Species Import and Export Management Office of the P.R. China and Endangered Species Scientific Commission, P. R. China) have brought the international trade of crab-eating monkeys under firmly control within the frames of CITES and China national wildlife protection law.

Each primate breeding company should apply for a breeding permit, the application are evaluated before an expert commission panel meeting case by case through rigorous evaluation processes. The country is implying a microchip labeling system for all primates bred in captivity.

Chinese national CITES authorities set up an import and export quota system for *Macaca fascicularis*, annual export quota is discussed and evaluated by the wildlife experts commission. The import quota is to control the inflow of crab eating macaques even though those macaques are legally bred in artificial breeding bases abroad, while the exporting quota is for controlling the sale of artificial bred macaques to international market. Both quotas regulate the *Macaca fascicularis* population size in the country. National and provincial CITES authorities and wildlife management authorities also conduct annual or periodic inspections on these primate breeding centers.



Figure 3 A primate breeding company in the Guangxi Zhuang Autonomous Region, China (Photo, Jiang Z.)



Figure 4 A crab-eating macaque breeding facility on the Hainan Island, China (Photo, Jiang Z.)

2.1.2. Purpose of the management plan in place

Purpose of the management of crab eating macaque in the country is to maintain a healthy breeding stock for sustainable trade of crab-eating macaque to the international laboratory primate market.

2.1.3. General elements of the management plan

The Wild Fauna and Flora Conservation Department of State Forestry Administration administrates the breeding permits, transportation permits, labeling, buying and selling of all terrestrial wild animals, including primates. The national wildlife management authority is also responsible for implication of the annual primate export quota system in the country. CITES national scientific and management authorities actively involved in the annual importing and exporting quota setting process and CITES national management authority is responsible for issuing export permits for import and export crab-eating macaques. China Experimental Primates Breeding and Developing Society with all primate breeding companies as its members, negotiates minimum price, coordinates meetings, and negotiates feeding standards and breeding standards and exchanges information.

Breeding permit and export quota are decided by an expert commission panel meeting which is called in by the national wildlife management authority. The commission is composed with specialists from the national CITES scientific authority, academics and universities, wildlife society, zoos, safaris, and CITES management authority.

According to the Administration Permission Law of PRC which was put in effect in 2004, those who want to set up a primate breeding company?import and sale of artificially propagated primates should first submit applications to the provincial wildlife management authorities, the provincial wildlife management authorities then transfer the applications to the national wildlife management authority. On receiving such applications, the national wildlife management authority will inform the applicant that his/her application has been received and processed, a decision of "Yes" or "No" will be given within 20 working days after receiving his/her application. Then the expert commission panel meeting, which usually chaired the executive director of the national CITES scientific authority, will be held. The expert commission will review each application for primate breeding company case by case. During the evaluation process, applicant will first give an oral presentation of his application before the panel. The applicant is asked to present his/her wildlife breeding permits, his/her business operation licenses, certificate of the operational funds, the certificates of the veterinaries and technicians in the primate breeding company, documents of origin of the breeding herds and photos of their breeding facilities. The applicant should also demonstrate his/her company has met the requirements of sanitation and animal welfare requirements. After the presentation and documents checking, the experts will discuss the issue in a close door meeting. A notification of "Yes" or "No" decision will be reached after the meeting and the decision will be sent to the applicant with 15 days. When it is "No" decision, reasons for refusing the application will be given in the notification.

2.1.4. *Restoration or alleviation measures*

Crab-eating macaque is an exotic species to China. Restoration or alleviation measures do not apply to this case.

2.2. Monitoring system

2.2.1. *Methods used to monitor harvest*

The State Forestry Administration, national CITES management and scientific authorities closely monitor the trade of primates in the country. Such a monitoring system has several parts: the annual export quota and its modulation, issuing export permits and checking the permits at border control by custom officers, monitoring data base maintained by the national CITES authorities and annual review of the annual export quota. Experts are involved in the monitoring of harvest of crab-eating macaques.

2.2.2. *Confidence in the use of monitoring*

Until now, the country has successfully implemented a primate trade monitoring system. Monitoring of the trade of crab eating macaques in country is conducted with scientists. Experts are actively participate in the process of issuing breeding permits, setting up import and export quota, inspection of primate breeding companies. We have confidence in the use of monitoring system is because all crab- eating macaques are in captivity and under man's care.

2.3. **Legal framework and law enforcement: Provide details of national and international legislation relating to the conservation of the species.**

China ratifies CITES in 1982. In 2005, the State Council of P. R. China proclaimed the Regulations of the People's Republic of China on Administration of Import and Export of Endangered Wild Animals and Plants as a national law for enforcement of CITES. All international trade of endangered species must have CITES permits in the country, even those captive bred wild animals as sika deer (*Cervus nippon*) and wapiti (*Cervus elaphus*). All exporting and importing of CITES Appendix I species and the exporting the CITES Appendix II species should have a Non-detrimental Finding evaluation by national CITES scientific authority, before the national CITES management authority issuing an export or import permit. The custom officer will check the permits of each wildlife trade. For importing CITES Appendix I species, the exporting permit form the CITES management authority of the country of origin should be obtained at first hand and presented to the national CITES scientific authority before issuing an importing permit.

All primates are protected by the National Wild Animal Protect Law of P. R. China which proclaimed in 1988. It needs permits from the national wildlife management authority to capture, to breed, to transport, and to sell and buy a Class I National Protected Wild Animal, for Class II National Protected Wild Animal, it needs a permit from the provincial wildlife management authority. According to the National Wild Animal Protect Law and Regulations of the People's Republic of China on Administration of Import and Export of Endangered Wild Animals and Plants, exotic wild animals listed in CITES Appendix I, are granted the Class I National Protected Wild Animal status whereas exotic wild animals listed in CITES Appendix I, are granted the Class II National Protected Wild Animal status in the country.

Noticing the increasing demands for primates as laboratory animals in the international laboratories and booming the primate farming business, particularly crab-eating macaque farming in the

country, SFA issued an official notice, The Official Notification No.124 of SFA, in 2004. In the document specifies the management of experimental monkeys, such regulations on breeding, selling quota, lowest sell price, and methods of examining the primate breeding companies.

3. UTILIZATION AND TRADE FOR RANGE STATE FOR WHICH CASE STUDY IS BEING PRESENTED

3.1. Type of use (origin) and destinations (purposes) (e.g. commercial, medicinal, subsistence hunting, sport hunting, trophies, pet, food). Specify the types and extent of all known uses of the species. Indicate the extent to which utilization is from captive-bred, artificially propagated, or wild specimens

Crab-eating macaques are important members of ecosystems and may serve as a basis for ecotourism ventures in the countries of origin. Along with other species of macaques, crab-eating monkeys have benefited humans through their use as research models in immunology, surgery, toxicology, and pharmacology. The crab-eating macaques which exported from China are basically for medicinal and research purposes.

3.2. Harvest:

3.2.1. *Harvesting regime*

All crab-eating macaques were harvested from captive-bred herds for exporting. Age of the export macaques are of range of 2-5 year old. Some customers may have special requirement, such as for using as model of diabetics study, experimenters may want to buy aged macaques.

3.2.2. *Harvest management/control* (quotas, seasons, permits, etc.)

Harvest quota and permits are required for harvest crab-eating macaques in China.

3.3. Legal and illegal trade levels: To the extent possible, quantify the level of legal and illegal use nationally and export and describe its nature.

In legal trade level, China CITES authorities authorized exporting of 2,580 living crab-eating macaques in 2005, 3,474 living crab-eating macaques in 2006, and 6,190 living crab-eating macaques as experimental animals in 2007. The main destination of the trade was the U.S.A. More than 5,000 units of other derivatives of crab-eating maca-

ques such as serum, plasma, or tissues were exported from medical experiments from 2005 to 2007. Main destinations of those crab-eating macaque derivatives were Japan, U.S.A., Canada and France. Two cases of illegal imports of several hundreds living crab-eating monkeys were reported in 2004 and 2006, respectively. The smuggling of live primates were sized in southern China and detained and smugglers were prosecuted. However, the level of illegal trade of crab eating macaques was low to compare with legal tread level.

II. NON-DETRIMENT FINDING PROCEDURE (NDFs)

Provide detailed information on the procedure used to make the non-detriment finding for the species evaluated.

1. IS THE METHODOLOGY USED BASED ON THE IUCN CHECKLIST FOR NDFs?

yes no

2. CRITERIA, PARAMETERS AND/OR INDICATORS USED

Criteria/parameters are needed to be considered for NDFs of *Macaca fascicularis*:

- a) The *Macaca fascicularis* is artificially bred in the country with artificially bred macaques from the ranging countries as founders.
- b) *Macaca fascicularis* breeding company do not require wild caught crab-eating macaques for breeding.
- c) The exporting volume of captive breed *Macaca fascicularis* is small compared to the captive breed macaque population; thus such a exporting will not hinder the breeding of the population.

Methodologies can be implemented to measure them:

We are closely monitoring *Macaca fascicularis* population size and other population parameters such as birth rate, mortality, age structure under current import and export quota system in the country.

How can be those data analysed to take decisions on that species use:

- a) A large scale artificial propagation of *Macaca fascicularis* can meet the demands for medicinal, biological, behavioral and psychological experiments.
- b) Such an artificial propagation of *Macaca fascicularis* is self sustainable, which does not need recruitment of wild *Macaca fascicularis*.

3. MAIN SOURCES OF DATA, INCLUDING FIELD EVALUATION OR SAMPLING METHODOLOGIES AND ANALYSIS USED

The national wildlife management authority and national CITES authorities investigated the trade and breeding of *Macaca fascicularis* in the country. Particularly, the CITES scientific authority investigated nine *Macaca fascicularis* breeding companies of the sizes of less than 100 to more than 12,000 crab-eating macaques for writing of the NDF case study this year. The *Macaca fascicularis* breeding companies were established during the period from 1986 to 2003. The founders of the breeding herds were mainly from confiscated or imported captive bred *Macaca fascicularis* from Southeast Asia countries. Those breeding centers had different crab-monkey breeding capacity, the breeding cages they have ranged from 3 to 600. One male and seven to ten female monkeys are kept in a breeding cage. Average annual survival rate of captive-bred crab-eating monkeys in China is about $94\% \pm 3\%$. Average annual mortality of those breeding centers is about $4.3\% \pm 2.2\%$. Up to August 2008, there are about 170,000 crab-eating monkeys including 60,000 female and 10,000 male breeders kept in 40 breeding companies in the country. In 2007, 50,000 crab eating macaque infants were born in the primate breeding companies in China. In that case, annual quota of exporting crab-eating monkeys in China is within the level of sustainable trade. Average number of *Macaca fascicularis* exported from China during 2004 to 2007 was around 3,000 each year.

4. EVALUATION OF DATA QUANTITY AND QUALITY FOR THE ASSESSMENT

The data are collected during investigation to primate breeding companies, provincial wildlife management and national CITES management authority. Data quality was cross checked with the quota of national wildlife management, national CITES management and scientific authority. The trade records were kept by the national CITES management authority of trade permits cross checked with national custom records. The case study is collaborated with specialists, officers and entrepreneurs.

Sampling size and intensity is suitable for the case study. Altogether only nine primate breeding companies in four provinces or autonomous region: Guangxi Zhuang Autonomous Region, Hainan Province, Yunnan Province and Guangdong Province were investigated. The sampling intensity was about 20% of primate breeding companies and more than 30% of all *Macaca fascicularis* were sampled in country. The *Macaca fascicularis* trade and quota information are on the whole the country base.

5. MAIN PROBLEMS, CHALLENGES OR DIFFICULTIES FOUND ON THE ELABORATION OF NDF

None for the *Macaca fascicularis* case study.

6. RECOMMENDATIONS

- 1) China already has a large captive population of *Macaca fascicularis*. Under current trend, the artificially bred *Macaca fascicularis* will increase rapidly in the country. After several years, the artificially bred *Macaca fascicularis* population will exceed 200,000 in the country.
- 2) The increasing number of the captive bred *Macaca fascicularis* in China and South-east Asian countries will not pose impacts on the wild *Macaca fascicularis* population, because captive bred *Macaca fascicularis* populations are large enough for those populations to self sustain.
- 3) We estimate the share of international market demand for macaques as laboratory animals in coming several years is between 30,000-60,000 macaques per year for China. Such a demand will be met with the current size of captive bred *Macaca fascicularis* populations in the country. The long term trend of using *Macaca fascicularis* in world medicinal and biological laboratories are unknown, we suggest to study world demand for *Macaca fascicularis* and to set an upper limit of captive bred *Macaca fascicularis* for curbing the rapid macaque breeding business expansion.
- 4) Because of the high cost in maintaining laboratory animals and animal welfare issue, many companies in developed countries want to move their animal experiments overseas, especially to the developing countries. To cater to this demand, those primate breeding companies in developing countries should be transformed into animal laboratories with experimental facilities, trained personals and advanced animal keeping and health techniques. Now the experimental tissue samples from those experiments with *Macaca fascicularis* as experimental animals are exported from China are increasing rapidly, which indicating many experiments are undergoing in the country. For example, if generally an experimental macaque may produce 20 or so samples during an experiment, the number of the macaques used in those experiments was probably large. When primate breeding companies upgraded their experimental standard, those samples may be analyzed in the primate breeding companies *in situ*.

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