

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

Other proposals

A. PROPOSAL

LISTING OF *Elaphurus davidianus* ON APPENDIX II, under Article 2.a) of the CITES Convention.

B. PROPONENTS

The People's Republic of China and Argentina

C. SUPPORTING STATEMENT

1. Taxonomy

1.1. CLASS: *Mammalia*

1.2. ORDER: *Artiodactyla*

1.3. FAMILY: *Cervidae*

1.4. GENUS AND SPECIES: *Elaphurus davidianus* Milne-Edwards, 1866

1.5. SCIENTIFIC SYNONYMS: None

1.6. COMMON NAMES: Pere David's Deer, Mi-Deer, Milu, Si Bu Xiang

2. BIOLOGICAL PARAMETERS

2.1. Distribution

This species originally occurred in the lowlands(43-30 N) of northeastern and east-central China and Taiwan, a province of China; in addition, some population distributed in Japan, North Korea and Tajikistan(Cao Keqing et al, 1988). Fully wild animals disappeared from this region many years ago, it is about 100 years ago in the end of Qing Dynasty. But a herd was maintained in the Imperial Hunting Park, south of Beijing, until about 1900.

2.2. Available habitat

There is little information on the natural habitat of the species. Holocene specimens(from about 3,000 BC) in Taixian county of Jiangsu Province of China were found in association with Chinese water deer(*Hydropotes*

inermis), muntjac (*Muntiacus* sp.); sika deer (*Cervus nippon*), water buffalo (*Bubalus* sp.), pig (*Sus scrofula*), tapir (*Tapirus indicus*), rhino (*Rhinoceros* sp.), Asiatic elephant (*Elephas maximus*), macaque (*Macacus* sp.) and Chinese alligator (*Alligator sinensis*). This mixture of marshland species (e.g. alligator and water buffalo) and forest-dwelling species (e.g. tapir and sika deer) suggests that the milu may have lived in a mosaic of forest, marshland and possibly grassland, habitats (Cao et al, 1988). The species shows some adaptations for wetland living such as soft, wide-splayed feet. However, it is not obvious to what extent it would have favoured grassland or wooded areas.

2.3. Population status

The species is extinct in the wild, at present, most specimen of the species have been kept in captivity. According to the statistics of Manton (1987), throughout the world, total about 1750 individuals was kept in near 150 institutions of about 20 different countries. Among of them, 885 individuals in United Kingdom, 309 in the United States of American, 123 in Germany, 82 in China, 53 in Australia, 44 in Soviet Union, 35 in South Korea, 32 in the Netherlands, 31 in Canada, 29 in New Zealand, 23 in South Africa, 23 in Czech Republic, 21 in Japan, 15 in Poland, 14 in Spain, 9 in France, 7 in Belgium, 7 in Sweden, 4 in Italy, 4 in Hungary, 3 in Burma, 2 in United Arabic Emirates, 1 in Venezuela.

Between 1985 and 1987, China reintroduced the species to their native habitat in large scale. In Milu Park of Nanhaizi in Beijing, 2 colonies (1985 & 1987) were reintroduced 20 individuals (5 male to 15 female) and 18 individuals (18 females) separately. In Da Feng Nature Reserve, 39 individuals (13 male to 26 female) were reintroduced at 1986. In addition, some parks still keep some individuals of the species, the number is about 40. For the time being, total amount of the species in China is over 600 individuals. The Da Feng Nature Reserve hosted 268 individuals, Nanhaizi Milu Park 152 and Shishou City 110 (1996).

2.4. Population trend

The Milu appears to have already passed through a genetic "bottleneck" in which most genetic variance, presumably including most lethal recessive genes, was lost. This occurred around the beginning of the present century, when the population was reduced to a very low level, and a maximum of 18 animals were responsible for providing all the genetic diversity in the present population and it is possible that a single male was responsible for siring all of the first generation of calves born at Woburn (Sowerby, 1949). Thus, all Milu alive today are effectively close relatives. Scudder and Reveal (1981) used gel electrophoresis to look for differences in the plasma proteins of 12 Milu and found none, indicating reduced genetic diversity. Ralls et al (1979) were unable to demonstrate greater neonatal and juvenile mortality in offspring of deer known to be related from those not known to be related, which suggests that

inbreeding may no longer be a problem. Yu (1996a) used gel electrophoresis to analysis plasma proteins from 21 individual animals (17 male to 4 female) selected from captive population of Da Feng Nature Reserve, totally 45 spectrum belts, found none obvious genetic polymorphism. Therefore, the genetic variation of the species have been severely decreased by the reason of inbreeding, bottle-neck and genetic drift and its combination, thus, the purity of the captive population is relatively high. However, Milu in Da Feng seem to breeding successfully.

Most of present population of the species throughout the world are kept status of minor population, in-breeding of the species is difficult to avoid and lack of genetic material exchanging among different population would definitely make genetic diversity of the species further decrease(Collins,1983),thus a potential major threat to the population of the species for the time being. Liang et al(1994) made a research on the mating behaviour of the population in Nanhaizi, Beijing and Da Feng, Jiangsu, it is discovered that there are great difference on the opportunity of male mature individuals participating the mating. It shows that there may be some mechanism to anti-inbreeding in the mating system of the species, this kind of mechanism commonly expressed by the social or communicate behaviour of the population of the species, it is a kind of biological adaption formulated along with the evolution of the species so that to preserve its genetic diversity. On the other hand, the mechanism need appropriate sexual ratio and enough individuals within its population to take into effect, meanwhile, the adequate space for exercise.

Therefore, developing the population of the species in its number of individuals, enlarging its release area and increasing the interchanging of genes are the major task of the protection of the species, in particular to the protection of its genetic material.

2.5. Geographic trend

Since its first reintroduction to China, the species has been expressing stronger capability of adaption, although the species have been allocated in different locations with different natural or controlled conditions(Liang et al, 1993), successful breeding makes the number of individuals of the population annual increasing steadily. At present, 3 larger populations of the species existed in China. Detail information is as follows: Semi-free population in Da Feng Nature Reserve, releasing area is about 500 ha, totally 268 individuals are kept in this population in 1996; Release population in Shishou City of Hubei Province, the area is about 1500 ha, 110 individuals composed this population in 1996; Ranching population in Nanhaizi of Beijing, area is about 53 ha, altogether 153 individuals live in this population in 1996.

What we have to noting is that, although existed population of the species is keeping increase its numbers of individuals, the effective population within different population is still far away to meet the lowest level (50

heads) to prevent continuing decrease on its genetic diversity in short period. For instance, in 1994, there were only 26 heads (Yu, 1996a) of the Milu accounted for the effective population among total 191 heads of the population of Da Feng Nature Reserve, Jiangsu Province, in addition, the interchange of genes between different groups of the species is not fluently and present releasing area is too limited, both of them need to be improved.

2.6. Role of the species in the ecosystem

As the information about wild Milu is little in available, and almost all present population of the species is kept as captive population or semi-free population, therefore, we have not enough data to decide what role of the species in the ecosystem.

2.7. Threats

In the beginning stage of reintroduction the species, the main threat to Milu in Da Feng seem to be disturbance from dogs and Diseases. For the time being, the major threat factor is outside parasites infection, namely *Haemaphysalis longicornis*.

3. UTILIZATION AND TRADE

3.1. National utilization

In China, exhibition in the zoo, with permission of the Ministry of Forestry and some times jointed with Ministry of Construction.

In England, unknown.

In Argentina, sports hunting

In New Zealand, Milu are used to make hybridization with Red deer (*Cervus elaphus*), and accede success.

3.2. Illegal international trade

Unknown.

3.3 Legal trade

As Hunting trophies from several countries at international level. In China, as some new safari parks were established, some individuals of the species have been transferred to these new parks, although it take the shape of trade, actually, the decentralization of the species.

3.4 Real or potential effects of trade

At this stage, sport-hunting is its real effects of trade; As a species of deer, its antler, hartshorn, meat, bone, fat, blood and tendon have a potential effect for the medicinal use whenever the population of the species restore to rational level.

3.5 Captive-breeding or artificial breeding with commercial purposes (outside the range state)

The Milu appears to have been brought into captivity during the Zhou Dynasty(1100-156 BC). When Pere Armand David first described the species in 1865, Milu were only known to occur in the Imperial Hunting Park in Beijing. A small number of individuals were sent abroad, mainly to European zoos, before the herd was destroyed by flood and vivid disorder around the turn of the century. The last deer in Peking died around 1920 in a menagerie.

Between 1893 and 1895, the 11th Duke of Bedford collected together 18 Milu at Woburn Abbey, and these deer are the ancestors of all those alive in the world today, The 1986 world register included 1,406 animals, more than 600 of which were at Woburn. However, this is probably considerably less than the true number in the world, since some collections did not send information.

A herd brought into Argentina from Hamburg in the 197-'s thrived well in the south of the country. This group was reduced by sports hunting, but some 40 specimens were recently bought by a landowner in the same area, who has proposed to establish a management plan for the deer. The potential for exchange of specimens with those at Da Feng Nature Reserve seems to promising, for the deer in Argentina have adapted to local climatic and habitat conditions very successfully.

4. CONSERVATION AND MANAGEMENT

4.1. Legal status

4.1.1. National

In China, Milu is listed as category I species under the Wild Animal Protection Law (WAPL, 1989). Any hunting, killing, catching, raising, owning, transporting of the species must obtain the permission from the Ministry of Forestry. In any case of import and export, the species shall be deemed with the stricter measures taken by the state.

In Argentina, apparently none clear provisions.

In other countries, unknown.

4.1.2. International

None.

4.2. Management of the species

In China, there is an ongoing Reintroduction Project as result of cooperative action between the Ministry of forestry of the People's Republic of China and the World Wildlife Fund for Nature(WWF). Scientific support has been given by the Zoological Society of London. Thirty-nine deer were shipped from England to the Da Feng Nature Reserve in August 1986 and the majority were released into a 120 ha initial release area in May 1987. Till now, the release area has been enlarged to 500 ha, in addition, other 1300 ha area is designated as spare-release area for the species. During 8 years from 1987 to 1995, scientists from the Forestry Science Academy of China carried out extensive study and research on various aspects of the species, i.e., ecology, behaviour, population dynamics, habitat utilisation, food habit, diseases monitoring and population management(Liang et al, 1991, 1993a, 1993b, 1994; Lu et al, 1991, 1992, 1993, 1995; Yu et al, 1996a, 1996b), the finding provided scientific basis to the protection and management of the population in Da Feng Nature Reserve.

Since 1985, Nanhaizi Milu Park reintroduced the species at first time, the number of the species keep increasing. To remove the pressure exerted to the environment caused by the faster increasing of the population, the park disperse some individuals to the Shishou City, Hubei Province, the herd of Milu shows excellent adaption and now, this herd of Milu have developed to the third largest population of the species in China.

Management of Milu presents unique problems. There is virtually no information on their ecology before they became extinct in the wild, and descriptions of zoo animals are of little help. Data from the group in Argentina, living virtually in the wild, might contribute to gain understanding of habitat use and other biological aspects. In Argentina, landowners have proposed to set up a management plan for the captive population, aimed at enhancing the number significantly in the next few years.

4.2.1. Population monitoring

The Reintroduction Project at Da Feng Nature Reserve contemplates both monitoring of the herd and monitoring of the progress of individual deer, therefore, all individuals have been marked, with the assistance of periodically inspection or investigation to the herd of the species to identify problems in time and to keep accurate records of breeding and mortality.

4.2.2. Habitat conservation

In Da Feng Milu Nature Reserve, since 1986, the first shipment of Milu was reintroduced, giving the priority to the accurate monitoring to the herd, a series of actions were also employed to conserve its habitat. For example, dredging water system, digging out ponds, planting grazing grass, rotating graze and enlarging release area. Thus achieve its goal on the conservation of the habitat of the species.

In Nanhaizi Milu Park, the measure to remove pressure caused by the high density releasing is to dispersed some individuals to the other location so that to keep the habitat steady.

4.2.3. Management Measures

In 1995, The Forestry Science Academy of China set up a long term management plan for the Da Feng Milu Nature Reserve. There are clearly statement on the following aspects: Fence building of the nature reserve; Specific measures and methods on the management on the basic population, release population, nature population and effective population; Developing habitat; Development of nature reserve; Disease prevention of the herd; Scientific research and tourism developing etc.. Thus ensure the plan in comprehensive way to guide the developing of the nature reserve and to protect this species.

4.3. Enforcement

4.3.1. International level

Unknown.

4.3.2. National level

In China, Milu is regarded as category I species under the administration of WAPL. Illegal catching or killing of Milu shall, in accordance with the supplementary provisions on punishing the crimes of catching or killing the precious and endangered species of wildlife under special state protection of the Standing Committee of the National People's Congress of the People's Republic of China, be prosecuted for criminal responsibility;

5. INFORMATION ON SIMILAR SPECIES

Unknown.

6. ADDITIONAL REMARKS

As the heritage of Chinese nature and history, Milu is of special significance in memory. For the purpose to restore its wild population, Chinese Government

have put forward a lot of efforts and allocated nearly 10 million RMB yuan. Fortunately, at present, taming to the natural conditions of its original distributed area have acceded success, the work relating with wild population restoration of the species is carried out carefully and this kind of work have been assigned as one of seven key projects to rescue endangered species under the government of the state.

7. COMPLEMENTARY OBSERVATIONS

Milu have been extinct in the wild for a long period of time, most of present existed population are kept in captivity or as semi-free status. Main purpose for the present conservation of the species is to restore its wild population at last, by the preservation on the genetic diversity of these existed populations. The status suggested that, strengthening interchanging genes among different population of the species throughout the world should be regarded as major mean to take full advantage on the potential breeding capability of Milu. To avoid any risk to the restoration project of the species, CITES appendix II listing shall ensure us to get exact information on any exchanging or trade related with the species, thus would promise more efforts around with the rescuing and saving of the species under supportance of scientific records and data.

8. REFERENCE

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