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The role of sanctuaries in integrated conservation: the Endangered Asian Species Trust linking Monkey World – Ape Rescue, UK and Pingtung Rescue Centre, Taiwan, with the Dao Tien Endangered Primate Species Centre in Vietnam

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The Endangered Asian Species Trust, founded by Monkey World – Ape Rescue Centre, United Kingdom, organizes the rehabilitation and release of threatened South Vietnamese primates at the new Dao Tien Endangered Primate Species Centre in Cat Tien National Park Vietnam. This work supports the Vietnamese Government to enforce laws on stopping the trade in threatened primates, by providing a place for confiscated animals and facilitating the return to the wild of suitable candidates, boosting wild populations and working towards founding new populations in areas where they have become extinct, such as in regenerating lowland forests.

Key-words: Cat Tien National Park; Dao Tien Endangered Primate Species Centre; endangered primates; golden-cheeked gibbon; illegal trade; Monkey World – Ape Rescue Centre; regenerating lowland forests; rehabilitation.

INTRODUCTION

Monkey World – Ape Rescue Centre in the United Kingdom opened in 1987 and was one of the world's first primate rescue centres with a mission, at the time, to provide a home for confiscated Chimpanzees *Pan troglodytes* that had been taken from the wild and were being worked as 'props' for beach photographers in the tourist industry of southern Europe. Much has changed over more than 20 years and Monkey World now works around the world assisting governments to stop the smuggling of primates from the wild

and, where possible, to return them to the forest.

Monkey World has a particularly strong collaboration in Asia, working with the Pingtung Rescue Centre for Endangered Wild Animals in Taiwan since 1995. The Pingtung Rescue Centre was set up in 1993 by the Taiwanese authorities at the Pingtung University of Science and Technology, to provide accommodation for wild animals that had been smuggled into the country illegally. The Centre has a strong faculty in conservation biology, wildlife research and veterinary medicine.

The two centres have worked well together, with confiscated gibbons (*Hylobates* and *Nomascus* spp) and orangutans (*Pongo* spp) being transferred to Monkey World to free up space in Pingtung Rescue Centre, allowing the continuation of their successful work with the Taiwanese authorities to stop the illegal trade of primates in Taiwan. The two centres have also exchanged staff, trained veterinarians, investigated the illegal trade in primates in Asia, educated local people and the media about each other's work and, most recently, have joined together, along with Vietnamese colleagues, to start the Dao Tien Endangered Primate Species Centre in southern Vietnam, through the UK-registered

Charity the Endangered Asian Species Trust (EAST: Charity No 1115350).

The Monkey World and Pingtung team began investigating the illegal trade in Golden-cheeked gibbons *Nomascus gabriellae* in 2000 when an illegal shipment of Vietnamese wildlife, including several young gibbons, was confiscated at Kaoshiung Harbor in Southern Taiwan. In the following years, Monkey World assisted the British, French and Russian Federation governments in the confiscation and re-homing of smuggled Golden-cheeked gibbons. By 2010, four infants had been born at Monkey World as part of an international captive-breeding programme, the European Endangered Species Programme.

DAO TIEN ENDANGERED PRIMATE SPECIES CENTRE

In 2001, Monkey World and Pingtung approached the Vietnamese authorities in order to set up an *in situ* project that would make a difference in stopping illegal trade and supporting wild conservation. In 2008, the Dao Tien Endangered Primate Species Centre, located in Cat Tien National Park (CTNP) in southern Vietnam, was opened. This centre was established following the years of work investigating the illegal trade in Golden-cheeked gibbons *N. gabriellae* and Black-shanked douc monkey *Pygathrix nigripes*. The Dao Tien Centre and associated facilities took 9 months to build but it had been 7 years in the planning with the Vietnamese authorities. A good site was needed for the Centre, within the geographical range of the threatened primates, that would not have any negative impact on the limited remaining lowland forest in Vietnam. A 56 ha island, next to continuous forest, at the entrance to CTNP was chosen. All parties agreed that only threatened species of primates belonging to this region would be brought to the Centre and that the Vietnamese Forestry Protection Department (FPD) would work with Dao Tien and CTNP to confiscate any such primate that was discovered or reported to be kept illegally. All the parties involved (the

Ministry of Agriculture and Rural Development, the FPD, CTNP, Monkey World and Pingtung) agreed on this strategy.

Dao Tien (meaning 'Phoenix Island') is on the Dong Nai River and currently houses Golden-cheeked gibbons, Black-shanked douc and Pygmy loris *Nycticebus pygmaeus*. In the future, the centre may also rehabilitate Silvered langurs *Trachypithecus margarita*. Dao Tien is a rescue, rehabilitation and release centre and, as such, will not be holding any primates on the island that are not physically or mentally fit for release back into the wild. Traumatized, injured or diseased individuals that are not suitable for release will be re-homed within the international captive population.

REHABILITATION

Only the staff of FPD, CTNP and Dao Tien are legally allowed to confiscate primates that are being traded or kept illegally. Specialists from Monkey World and Pingtung, with many years of veterinary and primate care knowledge, then oversee the husbandry of the rescued primates.

Research conducted in CTNP in 2004–2005 provides valuable baseline data on gastrointestinal parasites in wild populations of varying habitat (Kenyon, 2007). On arrival at the Centre, primates are placed in quarantine cages for a minimum of 3 months, and their health and behaviour are monitored (Plate 1).

Individuals are checked for gastrointestinal parasites (e.g. helminths, amoebas) and a gastrointestinal parasite treatment schedule is started. It has been established that there is a high parasite species richness in wild primate populations in CTNP (Kenyon, 2007). Testing of individuals that arrive at the Centre has revealed parasites similar to those detected in the wild population, with the exception of *Giardia*, which has been found only in confiscated individuals but has not been recorded in the wild population. Because of the heavy pathogenic parasite burdens detected on arrival, initially, individuals are kept in the section of the enclosure with a cement floor, until the first treatment is complete; access to the



Plate 1. Golden-cheeked gibbon *Nomascus gabriellae* health checks carried out at Dao Tien by Pingtung and Vietnamese veterinarians. *Endangered Asian Species Trust.*

area with a soil substrate is delayed until after the treatment is finished. Faecal samples are tested frequently on site, with routine treatment provided every 6 months. One month before transfer to Phase 2, individuals are checked and only those with heavy parasite burdens are treated. The aim is to allow, if possible, a buildup of the non-pathogenic parasites normally found in a 'balanced' gut flora. It is not a good idea to release individuals that are completely free of parasites if they are only going to acquire a huge parasite burden the moment they are released.

During initial health checks, blood is taken for blood-cell count, biochemistry and disease screening. The primates are screened for hepatitis A, B and C, tuberculosis and herpes (herpes-simplex testing identifies any animal with either herpes simplex or herpes B). As a release centre, animals carrying viruses not normally found in that species cannot be

introduced into the wild population and, therefore, the presence of the herpes virus will eliminate an individual from the release programme and it will have to be managed in captivity. The screening tests undertaken at the time of writing are considered the most important in line with the limited financial and logistical resources available to the Centre. However, should more resources become available, a greater range of tests and those that are more accurate would be used in order to provide greater information for academic reference. A blood serum bank is now being collated to allow further testing to be carried out in the future. Primates are currently vaccinated against tetanus, and the measles, mumps and rubella vaccine will be introduced into the vaccination protocols in due course. Staff working at the Centre are also monitored and vaccinated by a CTNP doctor.

Each individual is microchipped and its details are entered into an animal-record database. Disease screening results of 27 gibbons from the first 18 months of the Centre's operation

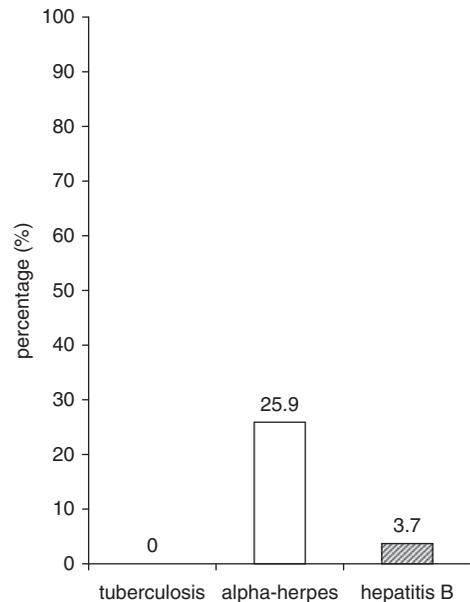


Fig. 1. Disease screening results for confiscated Golden-cheeked gibbons *Nomascus gabriellae* at Dao Tien Endangered Primate Species Centre Vietnam over an 18 month period in 2008–2010 ($n = 27$ animals).

reveal a low prevalence of infectious disease, meaning that sufficient numbers of healthy candidates have been able to proceed into the release programme (Fig. 1).

General body condition and teeth are checked. If teeth need attention, they are either treated immediately, if possible, or re-scheduled for treatment at a later date. Attempts to set up a standard protocol to assess body condition for reproductive health, which is important for successful re-establishment of breeding populations, have been impracticable to date. Ultrasound scans have triggered skin lesions owing to irritation from abdominal shaving and urine assays for reproductive hormones have had limited success because of funding constraints.

Hair is taken for DNA analysis in order to confirm that only primate species that belong in South Vietnam are kept at Dao Tien. Identification of northern and southern species for gibbons and doucs can easily be obtained through colour variation and genetic-analysis confirmation. Unfortunately, this is not the case with Pygmy loris, as the species looks extremely uniform over its entire distribution range and variations in colour have been found to be not regional but seasonal (Streicher, 2004), with recent investigations finding little genetic variation within the species *N. pygmaeus*. This inability to identify geographic origin could be a problem for re-introduction as lorises in the northern and southern parts of the distribution range experience very different climatic conditions. In the south, animals will have to overcome heat and drought, whereas very low temperatures and low food availability are the main challenges in the north. Little is known about the adaptive strategies of Pygmy lorises but on the assumption those from the south of the range might lack the appropriate adaptive strategies to survive in the very north, the project strives to re-introduce lorises that are likely to be from the south of the country. However, because neither genetics nor appearance provide definite cues to the origin of the animals and there is often not much information on the history of trade-confiscated individuals, the placing of these

primates remains a difficult and challenging problem for re-introduction projects.

Individuals that are known to originate from the north of Vietnam will be transferred in collaboration with the Endangered Primate Rescue Centre at Cuc Phuong. If animals are unfit for release, for example, as a result of extensive snare damage to their limbs, they will be transferred into the international captive-breeding programme. Individuals unfit for release owing to disease will be transferred to non-release centres with quarantine facilities in Vietnam and internationally, such as Pingtung and Monkey World. This developing relationship between *in situ* and *ex situ* centres is crucial, providing vital support to managed captive populations. The numbers of individuals in rescue centres and their health status have to be a major consideration for any captive-management programme.

Individuals that successfully pass the health checks are socialized with others, depending on age and gender. Most of the primates that have been kept as pets will have been in isolation and so they have limited social skills. Therefore, it is paramount to provide them with social interaction with conspecifics. In Phase 1, eye contact is kept to a minimum, interaction between keepers and gibbons is stopped and the gibbons are fed a variety of forest leaves and fruits in order to prepare them for their transition to Phase 2. Individuals that appear socially sound (interacting either with a mate or conspecific with the normal repertoire of gibbon behaviours based on observations), are of a suitable age (after sexual maturity, still of reproductive age or part of a family unit) and are physically fit [pass health screening and considered able to travel (brachiate and bipedally walk) through forest] are moved on to Phase 2, which is a 20 ha, forested, semi-free enclosure, on the southern tip of Dao Tien (Fig. 2).

The purpose of this area is to allow the gibbons to be able to travel and find food in the forest. If gibbons are paired, they need to learn to stay together, which is not an issue in a small enclosure but must be re-learned when in a large area. Perhaps the most important aspect of rehabilitation is the de-habituation



Fig. 2. Map of Dao Tien Endangered Primate Species Centre Vietnam.

to humans. The length of time necessary in this stage before the final release (which will be Phase 3) is not yet known for gibbons. The criteria for assessing whether individuals are ready to 'graduate' from Phase 2 to full release back into the National Park are as follows.

- Gibbons staying up high in the trees and not descending to the forest floor.
- Gibbons staying quiet or quietly move away if they see humans, in the same way wild counterparts would react.
- Gibbons eating a significant proportion of wild fruits and foliage.

The primates need to forget the idea that there is a link between humans and a potential food source, as no forest is free of people (e.g. rattan collectors and opportunistic hunters) and so the gibbons need to learn not to be interested in humans. Our specialist primate monitoring team has worked on the monitoring and habituation of a wild family group of gibbons for over one year and now patrol in

the semi-wild area to monitor the behaviour of the rehabilitating gibbons. When the gibbons reach Phase 3, this same team will be in the forest monitoring them after release.

In preparation for the larger primate releases, where the individuals may travel long distances in the forest (possibly > 10 km), we have started training our Vietnamese primate monitoring team in radio tracking. A radio-tracking workshop was conducted by the Pingtung Rescue Centre to train primate-care staff, CTNP technical staff and forest rangers. In August 2009, the radio-collared release of Pygmy lorises, which have ♀ home ranges estimated at < 2 ha, took place. Pygmy lorises have now been monitored on the island and in CTNP by our primate monitoring team and Vietnamese students (awarded Scholarships from EAST for radio tracking). Government guidelines will be produced for loris release in the south of Vietnam and the skill level of the monitoring team improved in preparation for gibbons.



Plate 2. The ♂ (left) and ♀ (right) Golden-cheeked gibbons *Nomascus gabriellae* fitted with radio-collars and released into a 20 ha semi-free forested enclosure for the Phase 2 of rehabilitation. *Endangered Asian Species Trust.*

In March 2010, the first pair of gibbons reaching Phase 2 were fitted with radio-collars to test their tolerance to being collared and the distance radio transmissions travel in secondary growth forest (Plate 2). We hope to fit global positioning system collars on gibbons identified for full release into continuous forest. Thus, in the early days of release, when location is very variable, constant monitoring is possible, providing valuable data. As yet we do not know which social grouping is most successful for release: (1) paired individuals with an infant, (2) pairs with no infant or (3) single individuals at a natural dispersing age. In Vietnam, rehabilitation centres take in new individuals on a regular basis, and pair bonds and breeding family units, often considered the ‘ideal’ for re-introduction, take many years to establish. Keeping individuals at centres for several years is not necessarily the best policy either for the centres, which have limited space

capacity, or the animals. If a protocol for the release of individuals or new pairs can be established, this would provide an enormous benefit for both the management of rescue centres and animal welfare.

The forest location for release has been selected based on habitat quality from ecological surveys of gibbons (Kenyon, 2007), distance to ranger station to ensure good protection, monitoring and density of existing resident gibbon groups. Before release, forest rangers from the mobile team, primate monitoring team and neighbouring ranger stations to the release site will be given extra tracking and protection training. In the summer of 2009, meetings started with the local communities to increase awareness of the primate rehabilitation process, with a potential for feedback. In February 2010, local ex-hunters were employed by Dao Tien to protect the gibbons and, so far, this has proved very successful, running alongside an

education-awareness programme in local schools, with scope for suitable students to be employed by the project in the future.

SUMMARY

For primate species that are not on the edge of extinction, allowing scope for well-judged risks to be taken to extend the present limitations of rehabilitation, it is a worthwhile challenge. Once release guidelines are developed, with releases into CTNP, individuals will be released into protected regenerating forest in the lowlands of Vietnam, creating new populations of Golden-cheeked gibbons and other threatened primates, guaranteeing a brighter future. The population of Golden-cheeked gibbons in Vietnam is estimated at around 5000 (M. Kenyon, pers. obs) individuals, with 20 000 (Traeholt *et al.*, 2005) in Cambodia. Estimates for Pygmy lorises and Black-shanked douc are not known but both are decreasing, and so efforts made now are vital. With an integrated approach, including a vast knowledge of management and husbandry in captivity, research in the wild and intensive post-monitoring protocols, many questions can be answered, so that in the future, if on the edge of extinction, an informed management plan can be developed and implemented.

The Dao Tien Endangered Primate Species Centre opened in July 2008, and as of January

2010, holds 27 gibbons and one Pygmy loris, with six Pygmy lorises and four Black-shanked douc already returned to the forest. Data collection on rehabilitation and post-release is ongoing, with EAST Scholarships given to Vietnamese students, working towards the development of Government guidelines for all species. The work at Dao Tien also incorporates a valuable Education Awareness Programme, working with local and international schools to encourage greater awareness, links to the local community and national pride.

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