WILDLIFE RESCUE AND MANAGEMENT OF KADOORIE FARM RESCUE AND REHABILITATION CENTER IN HONG KONG

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Abstract

The fauna conservation section of which the animal rescue center is an integral part, was established in May 1994 as a shift of focus of Kadoorie Farm and Botanic Garden (KFBG) from agricultural aid to conservation. KFBG is a privately managed and funded center for conservation and education. HRH Prince Charles kindly agreed to inaugurate the center's first flight enclosure for eagles in November 1994, providing a solid foundation as a recognized center locally and internationally. Since its establishment and up to the point of writing, the center has received 97 birds of prey for rehabilitation, 50 were released back to the wild after making full recovery and 27 became permanent residents of our Raptor Sanctuary due to their disabilities. An education program developed in 1994 has helped to publicize the plight of the wild animals that we care for and thus raise awareness among visitors to KFBG, of the wide-ranging problems facing these animals. Several of the birds of prey which are permanent residents are now part of a breeding program with the long-term objective of releasing their offspring back to the wild. Collaboration between KFBG and the HK SAR Government's Agriculture and Fisheries Department (AFD) is an important factor in the success of the center. All licences to hold protected native and exotic species are issued by the AFD. KFBG presently runs the only government sanctioned animal rescue center in Hong Kong.

Introduction

Kadoorie Farm & Botanic Garden (KFBG) is a privately managed and funded Center for Conservation and Education. KFBG is situated on the slopes of the mountain Kwun Yum Shan in the central New Territories (114°06'E, 22°25'N), Hong Kong and consists of 148 hectares of land, much of which is a protected nature reserve.

Following the establishment of the Fauna Conservation & Education Department in April 1994, and drawing on the pool of expertise among new and established staff, a rescue and rehabilitation programme was initiated for native birds and other animals. This was an extension of work started by Major Jim Ades, who rescued and rehabilitated birds of prey and owls. His work was officially sanctioned by the Hong Kong Government's Agriculture & Fisheries Department (AFD) in the 1980's. All birds initially cared for by Major Ades were passed to KFBG and became the first occupants of the newly completed Raptor Sanctuary. Expansion of the rescue center and the addition of a veterinary hospital, has allowed provision of temporary holding facilities for confiscated, threatened and endangered native and exotic animals passed to the center by the AFD.

The rescue work, in common with all other areas of work at KFBG is supported by a now, well established Education section. Public awareness concerning the problems facing our native wild animals is an important part of the conservation programme and aspects of the rescue work are incorporated into education material, tours and publicity.

The ethics of rescue and rehabilitation

Rescue work does raise complicated and sometimes subjective ethical issues. Since rescue and rehabilitation is a fairly new 'science' there is relatively little published information concerning species specific guidelines for quarantine, treatments and monitoring after release of successfully rehabilitated native species. Familiarity with ethical views is key to decisions made by a center regarding future placement or release. At KFBG we believe that our efforts to 'save' animals, some of which are rare or endangered, combined with the publicity generated by our education programme, contributes to increased public awareness and concern for environmental issues. Locations for release of recovered native animals are carefully considered to minimise any negative effects releases might have on the wild populations. Little post-release monitoring has been undertaken anywhere in the world, due to the difficulties of carrying out this sort of research (Morris *et al.*, 1994; Sainsbury *et al.*, 1996). But it is believed that rehabilitation to the wild of individual animals may have a negative or a positive effect on the wild population both in terms of competition for resources, and in terms of genes (Fox, 1995). Risk of introducing disease to wild populations is another serious consideration (Karesh, 1993; Davidson *et al.*, 1992; Woodford *et al.*, 1991,1993). An extended quarantine and observation period may help to some degree but this also increases the animals' captive dependence.

Several staff employed by the Fauna Conservation Department are local specialist ecologists, who have collectively carried out research work on Hong Kong habitats for many years. This experience and communication with, for example the Hong Kong Birdwatching Society, allows professional judgements to be made on whether or not releases and release locations are suitable for individual species. Although all released animals are tagged or banded, no recaptures have been reported or carcasses found since 1994. However, several birds of prey and 3 released Chinese Porcupines (*Hystrix brachyura*) were observed up to a month after their release.

We believe that threatened or endangered disabled animals, that accept their captive care, should be placed in a breeding programme and not simply be euthanised. This policy of course depends on resources and no wild animals should be maintained in captivity if they cannot be provided with space and fairly natural surroundings. One dilemma which all Centers that keep disabled wild animals must face, is eventual loss of space! This can be serious if the center has to turn away animals which have more threatened status in the wild, and may also have a good chance of full-recovery. In some cases it is necessary to locate another establishment with a good record for captive care of the species concerned. In any case we try to retain between 2-3 enclosures unoccupied in the event of urgent usage, but we have to be careful not to compromise the conservation objectives of the center.

For native and exotic animals entering a country illegally, IUCN "guidelines for the placement of confiscated live animals" IUCN/SSC RSG (1995, 1997) are designed to help Governments reach decisions concerning the fate of these animals. However, these guidelines are not species specific and do not suggest basic treatments and quarantine procedures for different animal groups.

Main objectives of the KFBG rescue center

a) to rehabilitate native wild animals and release on full recovery, to suitable habitats in Hong Kong.
b) to rehabilitate and/or temporarily hold exotic animals (mainly CITES listed) for the HK SAR Government, with the intention of re-homing to the country of origin or to suitable breeding Centers. This depends on facilities and expertise present to deal with the return of animals in the home country.

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c) to retain disabled animals (primarily native threatened species) which are still able to breed, so that a captive breeding programme for the species can be initiated with the aim of releasing the young native animals to the wild.

d) to retain for education purposes individual animals which cannot be released either because they are imprinted or suffer disabilities. These display animals provide an educational focus where visitors and school groups can learn about rescue center work and exposure to wildlife gives children a deeper sense of their relationship with the environment. Animals are only placed in display enclosures if they are not stressed by the experience and this normally depends on the nature of individual species.

Structure and Management

The rescue center is under the management of the Fauna Conservation Department and is divided into 3 sanctuary areas which include holding/ quarantine enclosures, display enclosures and treatment/ hot rooms. All veterinary procedures including preventive medical care, are carried out in the recently completed veterinary hospital.

General Manager

Veterinary Surgeon

REPTILE S SANCTUARY	RAPTOR SANCTUARY	MAMMAL SANCTUARY
Conservation Officer	Conservation Officer	Conservation Officer

Backup team: Vet nurse, Foreman, Workers/ cleaners

Each Conservation Officer has expertise in his/ her field of work and is responsible for the day to day supervision of the sanctuary. The conservation officers are assisted by 3 Education Officers who produce educational posters (in Chinese and English), PR material and guide visiting groups around areas of the sanctuaries which have special access. Volunteers are encouraged to work at the center and both parties gain much from the experience of sharing ideas and expertise.

Source of animals

Most of the animals which are treated at the rescue center come from 3 main sources; the Society for the Prevention of Cruelty to Animals (SPCA), the Agriculture & Fisheries Department (AFD) of the HK SAR Government and members of the public.

Source of Birds of Prey between May 1994 - December 1997

Source	Food/Pet trade Birds	Wild Hong Kong	Total
AFD	23	10	33
SPCA	3	61	64
General Public	-	14	14
Captive Bred	-	2	2
Total	26	87	113

When animals arrive there is a formal procedure which must be undertaken. As a condition of our Government licence to hold protected and endangered animals an 'acceptance form' is completed and this also provides an important record of the condition of the animals on arrival.

A policy concerning conditions for acceptance of animals for rehabilitation and temporary holding has been formulated between the AFD, SPCA and KFBG, as a result of a meeting which took place in 1996 between senior vets and conservation officers of the respective organisations. The policy is outlined below.

Acceptance of animals at KFBG

From members of the public:

Native animals (birds, reptiles, amphibians and mammals) requiring veterinary attention will be accepted if space and staff are available, providing the animals did not originate from local markets or illegal traders. Such animals should be sent to the AFD for observation and health control and may be passed to the rescue center later.

From the Agriculture and Fisheries Department:

We are permitted to accept any native sick or injured wild birds, mammals, amphibians or reptiles. These will be accepted for the purpose of treatment, rehabilitation and future release on the condition that sufficient space is available. If permission is granted by the Executive Director (KFBG) we will accept 'exotic' birds, reptiles, amphibians and mammals for treatment, rehabilitation and temporary holding until a suitable new home is found.

From the Society for the Prevention of Cruelty to Animals and private vets

We are permitted to accept any injured, locally found native birds, reptiles, amphibians or mammals. We cannot accept any bird, reptile or mammal, native or exotic that may have been smuggled into Hong Kong (e.g. birds from market raids or unlicensed reptiles from a pet shop raid) unless permission is first obtained from the AFD. Normally animals will be sent to the AFD first, for quarantine and disease control. In cases of mis-identification KFBG will notify the AFD for further actions.

Rabies control legislation requires that mammals entering HK must be retained for a period of quarantine. This also applies to threatened and endangered wild mammals which may have been brought into HK illegally for the food or pet trade.

The local food trade and pet trade are largely responsible for the CITES listed species which arrive at the center. During the winter months animals such as Chinese pangolins (*Manis pentadactyla*), giant salamanders (*Andrias davidianus*) and eagle owls (*Bubo bubo*) may illegally enter local food markets where the vendors can charge large sums of money even for parts of these animals. The fact that in Chinese tradition many wild animals are believed to have potent medicinal qualities also exacerbates the problem, for example eagle owls apparently improve eyesight! Educating the local public through media and visits to KFBG is thus an important part of our conservation objectives. It should be noted that the maximum fine for illegal possession of endangered species or their parts is HK$5 million! (over US$700 thousand). This reflects a Government commitment to stamp out the illegal trade.

A monthly report of animals under possession is sent to HK SAR Government and provides records of all the latest arrivals and releases during the month and contains updates on diagnostics and statistics presented in the previous report. The return is one of our administrative obligations for possession of a Government licence to hold native protected and CITES listed animals.

Veterinary care, quarantine and holding

On arrival of a new animal at the center, the vet performs an initial examination looking for obvious external injuries, parasites and diseases which can be picked up by visual examination. Most of the animals presented either have traumatic injuries or are malnourished.

Animals which do not require immediate treatment on arrival are immediately placed into suitable environmental conditions to optimize their chances of recovery and reduce stress, these conditions may vary depending on different species. Generally the animals are placed in a warm, quiet, darkened area and offered food and water. Birds may be placed in our Avian Intensive Care Unit or a 'cat carrier' in a suitable warm and darkened room. This supportive care is about the most important treatment that can be given to injured animals, it is simply to do, and is frequently carried out by the vet nurse or a conservation officer if the vet is not present.

If the bird or mammal is emaciated or very weak it is tube fed with an easily digestible glucose/carbohydrate/electrolyte solution such as Critical Care Formula (VETARK PRODUCTS) and then left for the next 12 hours. We always try to stabilize the animal and find out if it is willing to eat on its own before attempting any procedures that may cause further stress. Once the animal is stabilized the vet will perform a thorough examination which might include;
a) taking faecal samples to check for parasites
b) taking blood samples if generalised disease is suspected
c) taking radiographs and carrying out surgery if necessary
d) taking swabs for culture and sensitivity from wounds or bumble-foot lesions in birds
e) taking swabs from any oral lesions and examining them in the hospital for Candida or Trichomonas (especially in birds of prey)

Routine blood samples are only taken from valuable bird specimens, currently these must be sent to USA for analysis as there are no private laboratories in HK dealing with avian blood. Once the animal has adjusted to its new environment and any injuries/ diseases have been treated, preventative medicine procedures are carried out e.g. deworming and vaccination. Animals that have died of unknown causes are sent to the government pathological laboratories for postmortem.

It is useful to locate a friendly university or other research establishment that may have facilities or research staff available to assist with some of the expensive aspects of these procedures. Local universities can be made aware of opportunities to undertake postgraduate research on aspects of rescue center work, perhaps collaborating on the analytical side of preventative procedures.

After recovery, if not suitable for release, native birds of prey and mammals may enter our captive breeding programme or be held for educational purposes in one of the sanctuaries.

Table of problems evident in birds of prey received between May 1994 and December 1997

Problem	Received
Market Bird (bad condition)	25
Fledgeling	16
Starved & Dehydrated (wild)	13
Minor Impact Damage	33
Major Impact Damage	24
Egg Bound	1
Food Poisoning	1
Total	113

All efforts are made to provide animals in care with a varied and healthy diet. For carnivorous animals a choice of mice, rats, young chickens, quails, fish and insects are available depending on the species involved. Laboratory bred mice and rats are obtained from a local university as frozen 'left-overs' (mice are normally bred to excess at universities). Most universities with an animal house should be able to supply mice, and it is worth building relationships with such institutes which may be able to assist your programme at little or no cost. Chickens are bred at KFBG and other items are obtained from local markets. For herbivorous animals all fruits and vegetables are supplied by the horticultural section at KFBG and all vegetables are organically grown. Specialist (complete) food diets are also available in pellet form for most animals. Diets are carefully monitored and animals are weighed approximately once a month to determine food intake and to give a general guide to health.

Safety procedures are of paramount concern at KFBG considering the range of potentially dangerous animals we care for, which include wild eagles, caimans and macaques. As well as providing safety equipment such as hard hats, boots and goggles we have regular discussions about safety protocols for each species. Posters outlining safety procedures are also placed in our food preparation room. Some species like our Black-eared Kites become aggressive seasonally (breeding season) and although it would appear they are trying to be playful, this is not the impression given to the worker cleaning the enclosure as their talons grip! This kind of behaviour has to be monitored so that special attention can be paid to minimise injuries. Only conservation officers are permitted to handle the animals, and they are fully aware of the potential dangers of individual species under their care.

Public safety is also of extreme importance and cages are designed so that close access to potentially dangerous animals is not possible. For many animals that are undergoing rehabilitation there is no public access to their enclosures and some sanctuary areas only have public access when an education or conservation officer is acting as a guide.

Local release of wild animals after recovery

As previously mentioned in this paper, there are arguments for and against release of rehabilitated animals. At KFBG we recognise the dangers of releasing species into areas already occupied by the same species and all efforts are made to release in suitable habitats. For the rarer species this is important since others of the same kind need to be located for the release to be of any value. Animals should be released in the correct habitat, in an area within their natural range and at the right time of the year. This last point is particularly important where migrant bird releases are concerned.

The Hong Kong Birdwatching Society are notified about all bird releases so that sightings of rarities by members are not confused with birds just released by KFBG. The AFD are also informed of localities where releases are planned. Occasionally government officials, local experts and the press are invited to the release so that they can share the experience of this exciting moment. This gesture provides those in attendance with lasting memories and also helps to disseminate understanding concerning the principle and objectives behind the rescue work. Members of the public who have handed-in injured animals and show concern for their recovery are also invited to the release.

All birds released are banded with a coloured ring and a uniquely numbered KFBG metal ring. Methods of release depend on individual species. Young birds are normally 'hacked' back to the wild. This involves creating a feeding station where food is provided just before and then after release, in case the bird is unable to fully cope with its freedom during the critical period just after release. Adult birds that have spent up to a year in captivity are also provided a feeding station until they are able to cope with their new freedom. Whenever possible, prior to release, birds are observed in a flight cage to

determine if their flight is strong and symmetrical and to detect any other problems they might have in flight. Feeding stations are also provided for released mammals so they have an option in case they are finding survival difficult after release.

Noteable local releases include; 2 saker falcons (*Falco cherrug*), 3 eagle owls (*Bubo bubo*), a short-eared owl (*Asio flammeus*), 2 grass owls (*Tyto longimenbris*), a brown hawk owl (*Ninox scutulata*), a Christmas Island frigate bird (*Frigatus andrewsi*), a javan mongoose (*Herpestes javanicus*) and 3 Chinese porcupines (*Hystrix brachyura*).

Future placement of exotics

Although one of the objectives of our holding programme for exotics is to return them to country of origin or find a suitable establishment for long-term placement, it is a complicated issue and since many of the exotics we are holding officially belong to the HK SAR Government, they are the ultimate decision makers concerning future rehoming or placement. However, because of the part we play in caring for these animals, we do have some influence on decisions made and can at least be involved in an advisory capacity. Often suitable centers do not exist in the countries to which the animals being cared for are native. Animals therefore remain on long-term holding or it is necessary to locate a center somewhere in the world which has a successful record for captive care of the same species.

It is hoped that the neworking which is already taking place with other rescue Centers and zoos, will facilitate the decision making process as the result of an increased access to a wider pool of knowledge and experience.

Captive breeding from disabled individuals

One of the Centers' earlier stated objectives is to breed from disabled individuals. If the adults cannot be released due to their long-term disabilities we feel conservation work is still being accomplished if native offspring are successfully released, and especially when the species is locally rare. This is a difficult programme since it is not easy to breed from wild animals and may take years of patience and the correct care. Enrichment of enclosures is important and screening for some individuals is necessary. Accurate sexing is also important and quite difficult for some birds of prey for which DNA sex-coding has not yet been established.

One noteable success involves the center's Eurasian kestrels (*Falco tinnunculus*). In June 1996 two juvenile kestrels were successfully released a month after they were born in captivity. These were actually released with their father who had by the time the young were fledged improved his feather condition. The female who has been in captivity for approximately 7 years, is now paired with a new male who was a recent arrival to the raptor sanctuary. Other birds which are part of the captive breeding programme include eagle owls (*Bubo bubo*), collared scops owls (*Otus lempiji*), mountain scops owls (*Otus spilocephalus*), crested goshawks (*Accipiter trivirgatus*), black-eared kites (*Milvus lineatus*) and a pair of while-bellied sea eagles (*Haliaectus leucogaster*).

Education

One cannot underestimate the importance of education and in many ways a well designed education programme incorporating aspects of the rescue work, justifies maintaining some disabled animals in captivity to be used as a focus for the problems which are faced by wild animals. The alternative for many disabled individuals would be euthanasia. All enclosures possess colourful posters incorporating information on the individual species and conservation concerns for the species. Each disabled animal is given a name which we find helps to humanise the problems associated with each individual and the captive wild animals as a whole. Well designed worksheets are produced for school group visits so that children are made to think about the environmental issues affecting wild animals as well as learning something about the biology of individual species. Future staff exchange and KFBG based workshops on husbandry methods and vet care will help promote the work we are carrying out and give staff an opportunity to share knowledge and experience with other establishments.

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All staff of the Conservation and Education Department who since 1994 have worked diligently to make KFBG's mission a success. The Executive Director, Mr. Andrew McAulay who as a representative of the Kadoorie Family, has been instrumental in the development of the rescue center and has led KFBG toward its new goals, and Sir Piers Jacobs who is the Chairman of the board of Directors, and took a particular interest in seeing that the Raptor Sanctuary was established at KFBG. Also to Dr. Gail Cochrane and Jim Ades who made useful comments on the original draft of this paper.

Appendix I: List of CITES listed or locally protected MAMMALs held at KFBG on December 31th 1997

Species	Common Name	Cites (Category)	#Held
Callosciurus erythraeus styani	Styan Squirrel	-	1
C. erythraeus thai	Thai Squirrel	-	2
Paguma larvata	Masked palm civet	III (India)	1
Herpestes javanicus	Javan mongoose	-	1
Cynopterus sphinx	Short-nosed fruit bat	-	1
Trachypithecus obscurus	Spectacled langur	II	1
Macaca nemestrina	Pig-tailed macaque	II	1
M. mulatta	Rhesus macaque	II	1
M. Thibetana	Tibetan macaque	II	1
M. fascicularis	Long-tailed macaque	II	2
Total			12

Appendix II: List of CITES listed or locally protected REPTILES AND AMPHIBIANS held at KFBG on December 31st 1997

Species	Common Name	Cites (Category)	# Held
Iguana iguana	Green iguana	II	7
Varanus exanthematicus	Savannah monitor	II	1
Varanus salvator	Water monitor	II	3
Geoclemys hamiltoni	Black pond terrapin	I	1
Indotestudo elongata	Elongated tortoise	II	3
Geochelone sulcata	African spurred tortoise	II	1
Geochelone radiata	Radiated tortoise	I	1
Cuora trifasciata	Three-banded box terrapin	-	1
Platysternon megacephalum	Big-headed terrapin	-	1
Python molurus bivittatus	Burmese python	II	1
Boa constrictor	Common boa	II	1
Andrias davidianus	Giant salamander	I	2
Total			23

Appendix III: List of all BIRDS OF PREY and OWLS received and released by the KFBG Rescue Center between May 1994 & Dec 1997

Species	#Received	#Released	#Held	#Died
Asian barred owlet	7	4	2	1
Barn owl	1	-	1	-
Besra sparrowhawk	4	3	-	1
Black-eared kite	25	12	9	4
Black-shouldered kite	3	1	-	2
Brown fish owl	2	-	1	1
Brown hawk owl	4	1	1	2
Collared scops owl	22	16	2	4
Crested goshawk	3	1	2	-
Crested serpent eagle	2	-	1	1
Eastern grass owl	2	2	-	-
Eagle owl	9	3	4	2
Eurasian kestrel	6	4	2	-
Grey-faced buzzard	1	-	1	-
Japanese sparrowhawk	2	2	-	-
Mountain scops owl	2	-	2	-
Oriental scops owl	1	-	-	1
Peregrine falcon	1	-	-	1
Saker falcon	10	2	7	1
Short-eared owl	3	1	-	2
While-bellied sea eagle	3	-	2	1
Total	113	52	37	24

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THE STATUS OF CONFISCATED WILD ANIMALS IN INDONESIA AND THE MANAGEMENT OF ORANGUTAN REHABILITATION CENTER IN KALIMANTAN

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Abstract

Despite legal protection, several species of endangered species have been subjected for persecution, including the highly endangered orangutan. The establishment of legal protection has had little effect on the ongoing catching of wild orangutans. To facilitate law enforcement and to protect the orangutan, a rehabilitation center dedicated to the conservation of orangutan was set up in Wanariset, Indonesia. The rehabilitation center has been using new method to minimize the negative impacts of traditional rehabilitation procedures for releasing orangutans back into the wild.

The new rehabilitation method consists of three stages namely quarantine, socialization and release. Till July 1997, the project has processed 264 orangutans of which 109 have been released in two protected rainforest areas namely, Sungai Wain and Meratus in Kalimantan. Interestingly, we have been able to monitor orangutans released from our first group indicating the success of our new rehabilitation and release method. Although the number of incoming confiscated orangutans from East-Kalimantan has declined, more and more animals are reaching our Rehabilitation Center from other parts of Kalimantan.

Introduction

In spite of the legal framework of protection, wild animals have been subjected to waves of persecution, especially orangutans (*Pongo pygmaeus*). Law enforcement was almost entirely neglected, so that the establishment of legal protection had little effect on the ongoing illegal catching of orangutans. To facilitate law enforcement for orangutans, the Directorate General of Forest Protection and Nature Conservation needed to set up rehabilitation centers. This effort may be able to decrease the capture and trade of young orangutans.

Rehabilitation of orangutans was first developed by Barbara Harrison in Bako National Park in Sarawak (1960). In 1971 the Indonesian Nature Conservation Service (PPA), with modest support from the World Wildlife Fund, established a rehabilitation station at Ketambe in North Sumatra. A Kalimantan rehabilitation station was established in Tanjung Puting Wildlife Reserve by B. Galdikas. Subsequently another station was established in North Sumatra at Bohorok. In 1990 the Indonesian Directorate General of Forest Protection and Nature Conservation (PHPA) set up two additional rehabilitation stations near the Tanjung Puting Reserve. All rehabilitation centers were established in forest areas where wild orangutan population occurred. It was thought that the integration of wild conspecific would help the rehabilitation process of ex-captive animals and it would boost the dwindling number of the wild population.

During the time Herman Rijksen was working with rehabilitant orangutans in Ketambe, he concluded that the approach he was using was not optimal since it has several negative effect such as transferring human diseases to the wild population, social stress and over population.

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