OPERATIONAL GUIDELINES FOR WILD ANIMAL REHABILITATION

Kadoorie Farm & Botanic Garden
Wild Animal Rescue Centre
Hong Kong SAR

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About Kadoorie Farm and Botanic Garden

Kadoorie Farm and Botanic Garden (KFBG) is situated on the northern slopes of Hong Kong's highest mountain – Tai Mo Shan (957 metres). Within KFBG are streams, woodlands, orchards and vegetable terraces – together with conservation and education facilities. KFBG, today, is a unique public-private partnership, incorporated and designated as a conservation and education centre by Ordinance (Chapter 1156) in the Legislative Council of Hong Kong on 20th January 1995. While KFBG is a public organization, it is privately funded by the Kadoorie Foundation.

Since 1995, KFBG has focused on promoting conservation and sustainable living in Hong Kong and South China, with programmes on flora and fauna conservation and the promotion of organic agricultural practices.

KFBG's mission statement is "We exist to increase the awareness of our relationship with the environment and bring about positive change in the world through conservation and education".

To learn more about KFBG, please visit our website www.kfbg.org.

Editors

Gary W.J. Ades
Tan Kit Sun
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CHAPTER ONE

INTRODUCTION TO GENERAL RESCUE CENTRE PRINCIPLES

Introduction

The Operational Guidelines have been produced by staff at KFBG as a standard for the care of animals that enter the wild animal rescue centre rehabilitation programme. Many of the procedures are common practice for most well established rescue centres, some are modified procedures which are better suited to the environment in which we operate. KFBG employs professional staff who have collectively accumulated many years of husbandry experience in diverse faunal groups. We will continue to strive toward progressive procedures and maintain high standards of operation and hope we can share experiences with other established and new rescue centres.

Gary W.J. Ades, PhD
Department Head
Fauna Conservation Department

Our 'Code of Ethics'

This is an important starting point for all rescue centres, and will help management and staff to remember why the centre exists. The code also helps to guide all future decision making by the centre management.

i. The rescue team should be responsible and try to achieve high standards of animal care
ii. The rescue team must abide by local, regional and international laws concerning wildlife, wildlife rehabilitation and associated activities
iii. The rescue team should follow current health and safety practices at all times
iv. The rescue team should acknowledge limitations and seek the assistance of a veterinarian or other trained professional when appropriate
v. The animal care should be placed above personal gain
vi. Releasable animals should be maintained in a wild condition and released as soon as appropriate.
vii. The rescue team should encourage community support and involvement through volunteer training and public education.
viii. The common goal should be to promote a responsible concern for living beings and welfare of the environment
ix. Non-releasable animals which have no role in conservation, education or captive breeding should be considered for euthanasia

General Procedures

Identification of New Arrival

If an incoming animal cannot be identified it is almost impossible to begin to assess the animal's condition and to formulate a plan of treatment or husbandry for that animal, so the first step is to be sure the type of animal is known. For some species or individuals (e.g. Pangolins) captive husbandry can be so difficult that the best course of action could be to seek an immediate release if injuries are minor and the animal fits all other release criteria, in particular if it was of recent wild origin and native. In most cases regardless of condition, the animal should be quarantined prior to release (market animals could have been exposed to diseases that they would not normally encounter in the wild). A good library is required for accurate identification of different animal species. Access to the wealth of information available on the internet will also aid in identification and husbandry tips for difficult species.

Assessment of Condition

Once the animal is identified, ideally it should be inspected by a qualified veterinarian. The animal's size and weight should be recorded to compare with normals for the species in the wild. At this point, the veterinarian along with the rehabilitator should assess whether the animal is a viable candidate for rehabilitation. Animals which are very ill or with severe trauma may not be sensible choices for rehabilitation. If funds and manpower are limited, rehabilitating an animal which will probably never regain full fitness should be avoided. However for some cases this may be acceptable, for instance for very rare or endangered species which may be candidates for conservation breeding programmes locally or worldwide.

If no final placement can be envisaged for an incoming animal then it should probably not be rehabilitated and immediate euthanasia should be considered. Rescue centres that attempt to save everything will quickly run short of resources and not fulfil their basic objectives.

General Quarantine Principles

The KFBG Wild Animal Rescue Centre will endeavour to ensure that animals in quarantine and their waste will remain separated from all non-quarantine cases. Where possible, quarantine animals will be provided a dedicated facility. Due to the nature of a rescue centre and the flow of animals through it, it is recognised that total isolation may not always be possible. In such cases, husbandry and management practices will be modified to ensure that the best and most realistic quarantine barriers possible are in place.

Initial Housing

From the moment an animal is received, it should be maintained in subdued conditions with as little disturbance as possible. Lighting should be kept low (but complete darkness avoided) and sound and movement should be kept to a minimum. A temperature regime appropriate to the animal's physiological tolerances should be maintained.

For most smaller mammals and birds, boxes made of strong plywood with escape-proof ventilation holes and vertically sliding doors are suitable in leiu of purpose built hospitilization, intensive care or close observation units. The box should be large enough for the contained animal to stand up, lie down, turn around and perch**,** but not large enough to allow rapid movement or flight. This will help to keep an injured animal calm and reduce stress whilst allowing easy access to the animal by handlers. A box of this type should be used only until permanent housing can be utilised – perhaps 1-2 days maximum. If an initial examination finds the animal healthy it may go directly to more long-term and spacious housing.

Feeding

Many wild animals will not accept pre-prepared zoo-type diets and must be fed a diet that reflects their natural food. This can involve gathering of wild browse plants or fruits or the collection of wild insects (normally to supplement other dietary sources). Care should be taken to ensure that such things are from a clean healthy source (plants and insects may be contaminated with pesticides and carry parasites or bacteria). For animals which require meat in their diet it is recommended to have a supply of frozen whole prey items (mice, day old chicks, quail & rats) which can be thoroughly defrosted in water at room temperature (not hot water) 1-2 hours before they are fed. The freezing process helps to kill some of the potentially harmful bacteria in freshly killed prey items, but will also reduce the vitamin content of food items, so a recommended vitamin supplement should be used if animals are in captivity for the longer term.

General Cleaning Protocol

Hygiene is crucial when rehabilitating animals. Wild animals in a captive situation are under a great deal of stress and this suppresses their immunity. As such, they are prone to infection and disease at a much higher rate than in the wild.

Disinfection

Enclosures should be cleaned and disinfected at least once per day. The most common methods are hosing with water and disinfecting with dilute bleach. To facilitate cleaning, enclosures should have watertight, non-porous floors and good drainage.

Water / Food dishes

Dishes and pools should be sterilised with dilute bleach daily, and water should be refreshed whenever fouled or dirty. Water dishes need to be of a design or weight that can be accessed easily but not easily overturned.

Clean water

It can be a good idea with some animals, particularly mammals, to provide multiple water sources as some species routinely defecate in water thus depriving themselves of a clean source if only one is provided.

Food preparation

Feeding areas, preparation utensils and food bowls should be sterilised (not just rinsed) after every use to prevent the build up of harmful bacteria.

New animals

Should never be put in an enclosure before the area has been thoroughly disinfected, as the previous occupants may have been carrying harmful bacteria or viruses.

Release

The IUCN (International Union for the Conservation of Nature and Natural Resources) provides fairly thorough and clear guidelines relating to return to the wild of rehabilitated animals. Rescue centres should follow these well researched principals adapting them to suit local conditions. Basically, only NATIVE animals of known local genetic origin in a perfect state of health (i.e. parasite and disease free or directly from the wild with no contact with other animals) should be considered for release back to the wild. Release can be a stressful experience, as the animal must attempt to establish a territory within an existing population and find enough food in an unfamiliar area. Release location is a vital consideration. Where possible, current data showing wild population numbers should be checked to make sure that an animal is not being released into an area that has already reached its carrying capacity, or an area that should not contain the species in question.

Some animals will only be able to disperse from the release site fairly slowly, so the area must be able to sustain the animal and provide sufficient cover. Repeated releases in the same area should be avoided, especially with territorial species and those which disperse slowly. A release site may rapidly reach its carrying capacity for such species.

Some individuals will be unable to adjust immediately to wild release (especially longer-term captives or more 'intelligent' species that have quickly tamed in captivity) and a system to 'hack' the animals back to the wild should be adopted. This would normally involve housing the animal at the release site for around 7-14 days then allowing the animal access out of its enclosure (without forcing the animal out). Over the following days, the animal should explore the surrounding area returning to feed at the housing site. Feeding should gradually be reduced and eventually stopped over a period of days or weeks to encourage the animal to become independent. During the 'hacking' period, human presence at the site should be kept to an absolute minimum. This is however a very demanding procedure, the success of which cannot be guaranteed. Before proceeding down this path the conservation value of the animal should be given careful consideration.

Where possible, released animals should be monitored and if they appear to be in any difficulty they should be re-captured, rehabilitated and a new release strategy formulated.

Releasing back to the wild may not be a suitable choice for some 'rehabilitees'. If the animal is exotic or endangered it should be relocated to a permanent captive home i.e. placement of the animal into a recognized captive conservation breeding programme.

Non-native but rare species may be candidates for rehabilitation but they should either be transferred to a facility in their home range for later release, be maintained in a captive breeding programme or serve an education purpose.

Record Keeping

It is essential throughout the process of rehabilitation, from the moment of arrival to the last monitoring record or sighting to keep organised, detailed records of the process carried out. , These records should include everything from point of origin data, medical problems, feeds offered, to details of successes and failures in husbandry conditions and enrichment offered. Only by compiling this type of data in a useable format can the standard of care given to animals in rehabilitation be critically appraised and improved. Accurate records accrued over time can help in deciding which diet to use or avoid, what release methods to use or avoid and even which cases to attempt or avoid rehabilitating. The importance of full clear records cannot be understated.

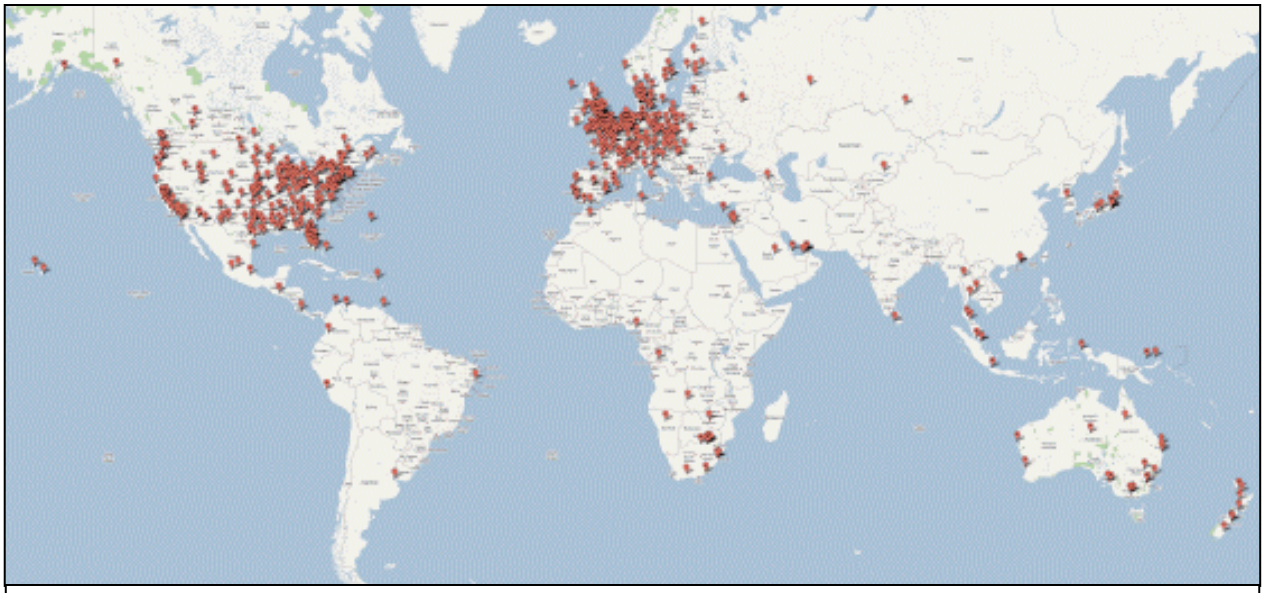
Records can be maintained either in paper format or via a computerised system.

ISIS ARKS

While a paper records system is cheap and has a short learning curve, a paper system has the drawback in that it takes up space and it is tedious when it comes to analysing data. A computerized system on the other hand speeds up report generation, data analyses and saves space.

There are very few (if any) comprehensive computerized zoological records software available. One organization that does provide the software on a subscription basis is the International Species Information System (ISIS). The software is called Animal Record Keeping System and is normally referred to by its acronym ARKS. The software license is only via a renewable annual membership. KFBG joined ISIS in 2004 and has since this date maintained a database for all animals entering the rescue programme.

ISIS provides its members with the world standard zoological data collection and sharing software, used by 735 zoos and aquariums in 73 countries. ISIS is the global database for the zoological community, containing information on 2 million animals – almost 15,000 taxa/10,000 species. ISIS members use the basic biologic information (age, sex, parentage, place of birth, circumstance of death, etc.) collected in the ISIS system to manage genetic and demographic programs for their animal collections.



Global map of ISIS Members. There is currently no equivalent shared database to that maintained by ISIS to keep track of captive wildlife

ISIS records are accepted and preferred by international regulatory bodies like CITES (Convention on international trade in endangered species). Several Regional Associations seek ISIS membership for their members: Europe: EAZA requires ISIS membership; Australasia: 100% of ARAZPA institutions with exotic animals are ISIS members; USA: 98% of AZA institutions are ISIS members. ISIS works in partnership with these regional Zoo Associations around the world.

Moving forward ISIS will be deploying the long awaited web based software called ZIMS (Zoological Information and Management System). Deployment is scheduled to start from April 2010.

See Appendix 22, 23, 24 for a sample of reports that ARKS can generate.

CHAPTER TWO

GUIDELINES FOR TERRESTRIAL MAMMALS

Introduction

The vast variation of mammal sizes, behaviours and body forms makes defining a set of general rehabilitation guidelines for mammals a major challenge. With species in Hong Kong ranging from the smallest Lesser Bamboo Bat at 3cm (3g) to the largest Wild Boar at 200cm (120kg) and habitats and life styles ranging from terrestrial to subterranean, no single set of rehabilitation criteria can function objectively in all situations.

The key to getting on the right track for successful mammal rehabilitation is to begin by having a thorough understanding of the natural history of the species in question. To get this information rehabilitators should have access to a good natural history library and should take advantage of the expertise held in zoological gardens or similar establishments across the world. Animal caregivers are often very willing to assist others with their care problems as they are all working toward a common goal.

Armed with an understanding of how an animal lives and feeds in the wild, a rehabilitator can normally begin to tailor care and husbandry towards providing suitable conditions for the species in question.

Initial Housing

It does not take a lot of contemplation to realize that housing for a bat will vary considerably to that of a bear, thus definitive mammal housing guidelines are inappropriate but certain common features should be consistent.

All newly received mammals will benefit from the provision of a quiet, darkened environment with a minimum of disturbance, avoidance of temperature stresses by providing a range that is within the animals normal environmental experience will also be of benefit.

Maintaining an animal in an enclosure large enough to allow it unrestricted movement but small enough to restrict or prevent high speed movements such as flight, running, leaps etc. for initial observation and a settling period is advisable. This also allows for ease of capture and handling that is likely to be required during the first few days and will help to reduce aggravation of any injuries not yet detected. Caging, offering restricted movement would be approximately the same size to that which would be recommended for transport of the same species.

In the longer term, housing units of this size may for some species become ideally sized “hide” boxes though again consideration of the types of activities carried out in an animals den or nest hole would adjust the hide size accordingly.

In a confined space, waste accumulation will be rapid so the accommodation should contain a substrate that allows easy cleaning yet provides a comfortable surface upon which to rest, providing texture, warmth and grip for the occupant. Depending upon the species, items such as wood shavings, newspaper (whole or shredded), vet bedding, towels, artificial grass, straw, woodchip, and hessian sacking have all been used successfully.

In such restricted housing and with newly admitted animals provision of climbing perches and furnishings may be unnecessary as falls or weakness may cause further injury to the animal.

However if the individual appears fit enough to utilize it and normally requires a specific substrate or perch type so as to be able to assume a normal resting posture, this should be provided (taking care to ensure the risk of complications are kept to a minimum).

Examples include, a single vertical post for Lorises to which they cling firmly whilst sleeping at ground level, and a textured wall or ceiling lining for bats even in short term accommodation, to allow them to suspend themselves in a normal resting position.

A loris will feel more secure given a single gripping post in this otherwise barren holding box.

Addition of towelling to the wall of the same box design allows this fruit bat to rest comfortably and naturally.

Confinement to these small quarters should last only until a veterinary inspection confirms that the animal is capable or able to traverse a larger less restrictive environment without risk to itself, or until such time that emergency treatment is complete and the above condition can be fulfilled.

This “settling and inspection” period should in general be no more than the first few days provided the animal has no major veterinary concerns.

A low, wide, heavy and damage resistant water dish suitable for many smaller mammal species.

A built in smooth concrete drinking trough with low gradient textured sides to allow easy access to the water source.

Water Provision

In all forms of mammal housing, water should be provided in a place which is accessible to the animal and cannot or is unlikely to be overturned or inadvertently drained. At some early stages of rehabilitation water supply may need to be restricted in volume and presented so that it is only adequate for consumption, not submersion or bathing.

Water may be excluded only upon veterinary advice or if there is a significant risk of drowning and likewise water bodies large enough to allow submersion (for water loving species) should only be provided after veterinary consultation.

Long Term Housing

Dimensions and Composition

In an ideal situation accommodation should increase in size and complexity as the rehabilitation process progresses, perhaps in a three-step process (too many housing changes will be stressful). Each stage working towards a situation that will force the animal to replicate skills required in the wild. By doing this the animal can develop fitness and behaviours which are compatible with survival in the wild, and it also gives the caregiver the opportunity to asses the animals' suitability for release.

Facilities provided immediately after the initial settling in period should generally aim to be at least as long and wide as 5 - 6 times the animal's maximum length (head to tail tip) and equivalent in height, however this is a rough guide only. For any longer term recovery or long-term captivity periods when the animal is capable of safely utilising a larger more complex environment then that should be provided. Many species may require fairly expensive enclosures (as compared to their size) depending upon their natural behaviour. Wild behaviour and habitat choice will also dictate an enclosures physical composition.

Animals, which spend 90% of their time submerged in water in the wild, should be provided with an enclosure that reflects this by providing a higher proportion of water (of the correct depth) than land.

High branching for an arboreal primate - space below to allow swifter movements.

Suspended mobile branching of different diameters.

Highly arboreal species should be provided with enclosures that provide exactly that, high roofs with ample climbing branches and perches, ground space with little height will not suit an arboreal species neither would little depth suit an aquatic species. The proportions of each feature are dictated by the wild behaviour of the animal.

Regarding height however, it is worth making one observation, an animal that can climb out of the handler's reach, is difficult to capture, therefore height of enclosure within which treatment animals are placed, needs careful consideration. Only once an animal is stable and off routine treatment of any kind is it wise to allow access to an enclosure in which the ceiling height is outside arms reach

Furnishing

The enclosure should be furnished in such a manner as to enable the animal to behave much as it would in the wild. The best enclosures are divided into two areas so that during cleaning the animal can be secured in one area whilst the other area is cleaned. A large lockable hide box or den will be suitable for some species but larger species may need a separate room or enclosure. Many mammals and their keepers will be under less stress or danger in a zero contact situation in which opening and closing of all doors or dens can be done from outside the enclosure providing safe access to clean the empty section.

Animals can be secured in a hiding box during cleaning.

Box closed to protect animal and staff working in enclosure.

Box opened before staff member leaves the enclosure.

Leaf litter provided for enrichment.

Hollow wood / bamboo can be used as hide and sleeping areas for arboreal species.

Hanging hide design which can be dismantled and cleaned.

All mammals should be provided with some form of retreat from public view. This is often in the form of a hide box or den areas, which should be appropriately sized as per the description given in the “initial housing” section. It may not require as frequent cleaning as many species will choose not to defecate or urinate in a den once it is adopted. It is important to provide sufficient hide spaces in a correct location in which the occupants can feel safe, some species are happy to share an enclosure but not a den so adequate provision and choice for all the animals should be made. Some species will require box-like hides at ground level whilst others will prefer high platforms; again, the animal’s wild behaviour must be considered.

When furnishing an enclosure there must be a balance between suitability for the animal and ease of cleaning and disinfection. The three dimensional nature of an animal enclosure should not be overlooked, the full volume should be utilized with the provision of perches, shelves, hides and swings where appropriate. An empty 5 x 5 x 5m smooth walled cage provides only 25m^2 of floor space for the animal to utilise, whereas adding different levels and branches can provide much more usable space and keep the animal more enriched.

A log pile is good for some ground mammals, whilst a mix of travelling branches is good for those that can climb.

Often mammals will require zero contact rehabilitation and husbandry in which opening and closing of all doors or dens can be operated from outside the enclosure, providing a safe work environment for the staff. A double door system is advised for all animal holding facilities to provide protection from accidental release, but also on occasion, to provide a safe retreat for staff attempting capture or enclosure management whilst an animal is in residence.

Sliding door design controlled outside the cage

Double doors

Enrichment

This is a vast and varied subject, the details of which are well beyond that which can be discussed here, however knowledge of the basic concepts is essential for successful housing of any species of mammal, whether discussing long-term captivity or a rehabilitation process. Animal enrichment encompasses any activity, item or stimulus, which without significant levels of stress can be provided to introduce interest and activity in an animal's daily existence. Enrichment can be in the most simple of forms, for example visual cues, scents, textures and tastes, or involve more complex, toys and tools designed to keep animals busy.

During rehabilitation period, it is probably advisable to stick to the more natural forms of enrichment available in order to prevent de-sensitizing, which could lead to too much acceptance of man-made objects. Examples include providing a mixture of fresh substrates, items and situations taken from the natural wild habitat, such as leaf piles, soil, sand, branches, flowers etc. As an animal travels around its action packed environment, it will encounter multiple different sensory inputs normally encountered in the wild, helping to keep it mentally prepared for wild experiences upon release.

Other enrichment items can include, but are not limited to naturally moving perches for climbing species, simulated flowing water or access to natural weather conditions, live prey items or scattered small food items to stimulate foraging and hunting behaviours.

Substrates

If the aim of the rehabilitation is to return an animal to the wild, providing loose or unsealed substrates can pose a difficulty. An unsettled unclean surface can harbour parasites, bacteria and disease that can burden the animal further with parasites from self re-infection. However if an animal is to be returned to the wild it must be able to behave in a natural manner and demonstrate wild abilities. This may often mean the ability to dig for food, dust bath, burrow, etc. A careful balance should be found in which adequate access to natural substrates and substances is available, but this must be done in a manner in which faecal contamination and soiling can be controlled.

For some species, providing just patches of soft substrate or containers that can be removed and replaced may be adequate. Most mammal enclosures however will require a hard sealed floor such as concrete, which allows easy cleaning and disinfection.

A soil filled digging box

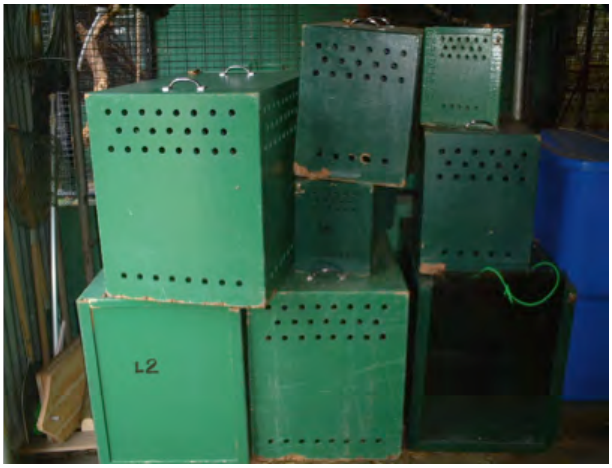
Combination of concrete and wood chip

Temperament of the Mammal

When dealing with nervous individuals care should be taken to screen enclosures from view. Small viewing holes can be used, with care, to check on the animal without disturbing it. Actions should be slow, deliberate and quiet around these animals. Disturbance should be kept to a minimum. This can make the difference between a wild animal feeding or not feeding. In some cases, nervous species may need a fast tracking release schedule in order to prevent cage-induced injuries.

Mammal Restraint, Handling and Transport

As a rule, physical restraint and handling should be kept to a minimum to reduce risk to handlers, animals and stress to both! Often with patience and pre-planning an animal can be encouraged to enter a closable sleeping or transport box without the need for physical capture, however physical capture will become necessary on occasions. Because of the diverse nature of mammals, a definitive guideline would be hard to provide. Methods suitable for mammal restraint range from direct manual restraint with suitable gloves, to veterinary immobilization for large aggressive species. All mammal restraint should be carried out with handler safely first and foremost and optimal animal comfort second.



An assortment of crates and temporary holding boxes are indispensable when animals need to be moved from one area to another safely

A rough guide to suitable restraint methods for a variety of size classes of mammals (primarily Asian) is given below but as always knowledge of the species and thus the threat it presents is essential:

Small Mammals:

0-5 kg e.g.: Squirrels, Bats, Rats, Mustelids, the smallest New and Old World primates (Lorises, Marmosets)
Soft nets, leather gloves (varying length and thickness), cloth bags (strong pillowcases), plastic or wooden holding boxes. A secure neck grip with gloved hands is often enough to safely handle this size group.

Medium Mammals:

5-15 kg e.g. Wild small Felids and Viverids (Leopard Cats, Civet Cats and similar), New World Monkeys (Guenons), Some Macaque species, Gibbons, Leaf monkeys.

Strong and deep nets, deep enough to roll closed and secure the animal, thick gloves, tough hessian or canvas sacking, wooden/metal transport boxes, snare poles, cat tongs crush cages. Neck grip used in some species in conjunction with other methods. However, primates in this class will need a special two-handed shoulder grip to be safe. May require veterinary assistance for anaesthetic based immobilisation.

Large Mammals:

15-100 kg e.g. Wild Boar, Barking Deer, large Primates, medium to large Felids, Ursids. Secure wooden or metal boxes and crush cages combined with animal runs to guide the animal inside, followed by sedation. No human contact during restraint is advised; seek veterinary assistance for sedative-based immobilisation. Seek expert advice.

Mega Mammals:

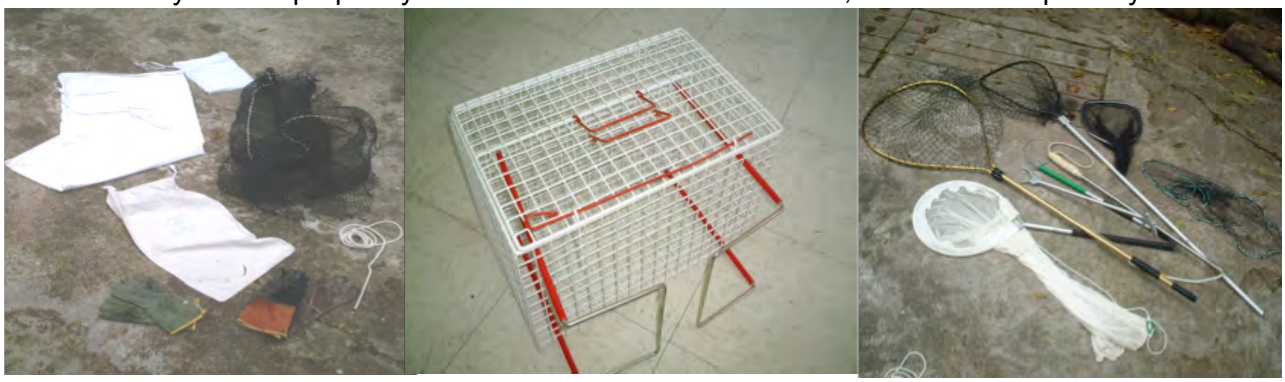
100 kg upward – e.g. Large Felids, Bears, Large Ungulates etc. - Seek expert advice.

Fitness, Release and Monitoring

Suitability For Release

Please refer to the release criteria guidelines (Appendix 4 and 7) to assess the suitability of the animal for release.

Whilst considering a mammal for release thought should be given to the fact that mammals are intelligent with a well developed capacity to learn. This can be beneficial during a release period in which they will adapt quickly to a new environment. However, this same adaptability will be



Some examples of suitable restraining equipment

working against the rehabilitator during the captivity period. The animals will accommodate to new food sources, and begin to adapt to their captive life. If the captivity period is extensive, then efforts will be required to ensure that new "bad habits" or captivity induced behaviours are minimised or prevented. A captive animal that has learnt to associate humans and food will not be well prepared for a wild release.

Before release of any mammal, particularly large mammals, careful consideration should also be given to the potential threat the animal may cause (to the public, nearby agriculture or livestock) and any legal restrictions the release of that animal may fall under.

Release Site

Where possible all releases should be carried out near the original collection site. In reality, this is sometimes unsuitable or impractical. In most cases, the best guidance is to follow the principals laid out in the IUCN guidelines for re-introductions and the IUCN Position Statement on Translocation of Living Organisms, also principals laid out in the International Wildlife Rescue Council Minimum Standard Guidelines for rehabilitation and release. Local habitat, food, shelter and wild population parameters should also be considered.

Small mammal hack cage. In this case a leopard cat being prepared for release into the wild

Releases

In general mammal release will fall into two categories: either direct (hard release), when a mammal is taken directly from the rehabilitation site and turned loose in the release site, or softer releases in which an animal is introduced to its release site in a controlled manner over a period of time gradually reducing its reliance upon artificial resources. The hard release is least time consuming for the rehabilitator and will be most suited to animals that have spent only a short duration in captivity, perhaps those that have had to recover from only mild or minor injuries (days rather than weeks or months in captivity).

A hard release of a healthy male barking deer that arrived in the WARC from the wild two days prior to the release. Healthy wildlife should be released back into their habitat as soon as possible.

Any animal that has spent a prolonged period in captivity (weeks or months) will be more suited to a soft release in which an enclosure is required at the release site in which the animal becomes familiar with the environment. After this familiarising period during which human visitation and contact is kept to an absolute minimum the enclosure should be opened allowing the animal to leave of its own free will. Feeding and monitoring of the animal should continue for a duration slowly reducing the amount over a period of days or weeks depending upon the animal's response to the wild environment and frequency of return visits to the release enclosure.

In some situations the animal may never return, making continued placement of food unnecessary, however a period of several days should be allowed to pass without evidence of the animals return before feeding is stopped.

Monitoring

In an ideal release situation, some form of post release monitoring should be carried out. However, effective methods can often be well beyond the reach of the average rescue centre. The most effective methods include radio and satellite tracking, however the cost and effort involved may only be justified when species of high conservation value are involved. Simpler forms of monitoring can include visibly marking or tagging of the animals (ear tags, hair clipping, dye markers). This allows remote recognition of the animal by either direct viewing or by remotely triggered cameras.

Any evidence collected as to the success or failure of a release effort is constructive information allowing modification, re-consideration, and improvement of future release efforts.

CHAPTER THREE

GUIDELINES FOR NON BIRDS OF PREY

Identification

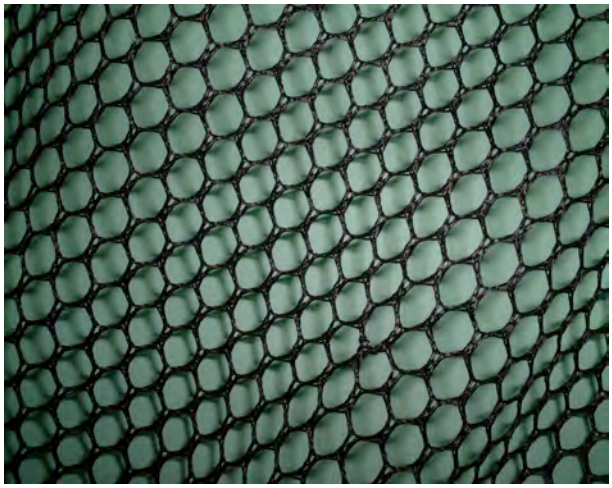
The most important element of bird rehabilitation is identifying the bird species. Even if you cannot get down to the finer details such as exact species or even sub-species, you should at least determine the bird type. This can be done by researching books, the Internet or through contact with bird experts or local bird watching groups and enthusiasts. Establishing the identity of your bird will help you to work out what it needs in terms of correct handling procedures, housing, feeding and eventually release habitat, should it be successfully rehabilitated.

An assortment of guide books is essential

Safety, Capture and Restraint

When capturing or restraining a bird, care should be taken to minimise potential harm to both the bird and the handler. Most birds can be caught by use of a net attached to a telescopic or fixed pole. The net should have a large opening, sufficient to surround the entire bird with enough depth to contain the bird without further escape once caught. The mesh size should be smaller than the birds head size to prevent the bird from attempting to push its way out, or becoming tangled. Soft, non-knotted mesh is more suitable for smaller birds, as knotted mesh can be quite abrasive.

Soft, non-knotted mesh



Soft, non-knotted mesh, close up

Some larger species such as Egrets, Waterfowl, and Peafowl can be caught by hand. Once caught the upper part of the birds back and wings should be secured, bringing the birds back close to your body so that you can use your stomach or chest for support, freeing up your hands to restrain the feet and head if necessary.

Safety
Safety equipment such as eye protecting goggles and gloves, should be worn while handling dangerous birds, especially species such as Egrets, Herons & Bitterns, which often strike fast using their long sharp beaks. Towels can also be used as a means of restraint to wrap around the bird preventing it from flapping its wings.

Restraint
While restraining a bird, care should be taken to prevent unnecessary stress. When captured, it is normal to see an increase in the respiratory, blood pressure and temperature rates of the bird, all of which cause stress to the body. The handling or restraint time should therefore be kept to a minimum. Unlike most other animals, birds do not have a diaphragm, therefore care should be taken not to squeeze or hold the chest area too tightly preventing the bird from breathing.

Handling
While handling birds it is important to take great care not to damage or accidentally remove any feathers. A bird relies on its feathers to maintain body heat and provide waterproofing as mentioned in later paragraphs. The loss of feathers during capture or handling can sometimes be unavoidable, especially when dealing with species such as Doves that have very loose feathering designed to aid escape if caught by a predator. Sweat or moisture from a handler's hand(s) is easily transferred to birds' feathers, removing normal feather dust or oil giving the bird a 'ruffled' appearance. Over-handling can easily damage newly forming feathers, this is visible once the feather has grown through, the damage appearing as stress lines running horizontally across the feather.

Transportation

If a bird requires transportation, after capture it should be transferred into a holding or transportation box.

Box requirements
The box should be solid and sturdy so that it does not collapse or become weakened in any way during transportation or housing of the animal. The box should be constructed of a washable material so that it can be disinfected between uses. Solid walls (with rows of ventilation holes) made from wood are preferable; birds easily damage feathers on wire mesh. Upward sliding doors are easier to use, allowing the handler to open the door as much or as little as necessary in order to place or remove a bird, thus reducing it's 'window' of escape.

Note the ample ventilation holes. It is an IATA requirement that 25% of the vetical surfaces have be ventilated

The box should be fitted with an appropriate number of handles required for people carry the weight of the box plus the animal inside. The inside of the box should be lined with a substrate such as Astroturf, a towel or newspaper. This will help absorb any fluids or liquids such as faeces or drinking water, and more importantly provide the bird with something to grip, to prevent sliding during transportation. A floor substrate is often preferable over a fixed perch if the transportation time is short. Food and water would not be provided in the transportation box unless the bird is required to travel for several hours. Transportation time should be kept to a minimum to prevent stress

Housing

Before transferring a bird into a cage or aviary, a quick assessment should be conducted to determine the most suitable type of housing required.

Bird assessment considerations include:-

1) Fitness 2) Temperament 3) Space Requirements 4) Other/Special Requirements.

Sick or Temporarily Disabled Birds

Birds with wing injuries must be kept in a cage or enclosure, which restricts or discourages movement that may cause additional damage. Usually small, enclosed spaces with subdued lighting that deter flight are preferable.

Nervous Birds

Nervous birds may require the cage to be screened off or a simple nest box placed inside, to provide somewhere to hide thus making it feel more at ease. For such cases the cages or enclosure should be located in a quiet area and disturbance kept to a minimum to reduce stress.

Birds With Minor or No Injuries

Should be provided with ample space, allowing and encouraging free movement, wing stretching and ability to perform short flights in order to keep flight muscles exercised prior to release.

Perches, Ponds And Floor Substrates

Perches

The bird type is determines the internal features necessary in the cage. Almost all birds require something to perches. Natural branches of varying diameters are preferable; the size of the bird's feet may dictate requirements. The branches should be placed in such a way that when perching no other branches interfere with the bird's body, causing unnecessary feather damage especially to the tail and wings. This could lead to a delay in the bird's release. It is important to remember that most birds will instinctively choose to perch on high branches, away from the threat of potential predators, therefore some branches should be placed as high in the cage as possible, but at a manageable level, so that the bird can be caught if necessary. This can also help to reduce stress.

Not only does the spoonbill feed from the pond but they also drink from it. Therefore it is essential that the water is changed daily

Ponds

Built in or temporary ponds, are an essential asset when rehabilitating wading or water birds. Plastic tubs, children's paddling pools and empty plastic sandpits can be used as removable or temporary pools. Ponds can be used for a variety of different purposes. They can be used as a source of exercise e.g. swimming for water birds, helping to keep muscles fit and active, and as a place for refuge when the bird feels stressed.

Water birds require access to clean water for daily washing and preening to maintain the feather's waterproof layer.

Without prolonged access to water, water birds such as ducks quickly lose their waterproofing that are essential not

only for maintaining body temperature but also for buoyancy. Without it they easily succumb to cold weather and can even drown.

Shallow ponds are useful as feeding areas for wading birds in particular. Both live and/or dead food can be presented, encouraging natural feeding behaviour.

If using a pond for swimming, it is important to make sure the water level is equal to the outer depth of the pond thus allowing the bird to get out of the water easily, especially for steep sided or non-sloping ponds or dishes. The pond surface should be textured to prevent the bird from slipping while foraging and when climbing in and out of the pond. If smooth plastic ponds or dishes are used it is useful to cover the floor of the container with a textured, washable substrate such as Astroturf or other plastic carpeting materials.

Substrates

Floor substrates can be very diverse and each is used for different reasons to improve the rehabilitation process. This is a short list of just some of their uses: -

- To provide somewhere to hide e.g. branches, leaves.
- As a feeding source to encourage natural foraging – food placed amongst leaves or woodchip.
- As a textured surface to help prevent foot problems such as bumble foot from developing – pebbles, Astroturf.
- As a barrier from potential cold surfaces (concrete floor) – Astroturf, branches, leaves, woodchip.

Feeding

It is important to consider the natural feeding habits of a bird when deciding what to feed and how to present it in captivity. As a simple rule, food for tree dwelling birds should be placed off the ground preferably on or near high branches while ground dwelling birds should be fed on the ground. While some passerine birds are happy to feed from a simple dish, some birds have more specific needs. As mentioned above, water and wading (fish and crustacean eating) birds prefer to eat in water and so shallow ponds may be required. Birds which probe their beak into the ground in search for food require shallow to deep, soft, soil filled trays that can be loaded with food items such as worms and insects. Others prefer to search through leaf litter or grass for insects. Trays commonly used as cat litter trays work well for this. The ways in which to present food is only as limited as your imagination!
A good selection of different food types should be maintained at all times. Most rehabilitation facilities have no way of predicting what type of bird or when a new bird may be received.

Below is a general list of basic food items that should be available in your feed store at all times:-

Fresh vegetables: leafy greens, carrots etc.
Fresh fruit: apples, bananas, tomatoes, papaya etc.

Grains, Cereals and Pulses: corn, barley, beans etc.
Seeds: millet, hemp, sunflower etc

Whole Fish/Seafood: fish, loaches, shrimp etc.(fresh dead or frozen)

Whole Meats: chicken, quail, mice, frogs etc. (fresh dead/live or frozen)

Insects: crickets, grasshoppers, mealworms etc

Commercial Diets

Commercially pre-prepared bird diets are very useful if available. They are nutritionally balanced, which is a concern when producing 'homemade' diets. They not only save time to the rehabilitator and in general produce far less wastage, but they can also be more cost effective,when compared to the costs of purchasing individual ingredients necessary for your homemade diet.

Frozen Products

When using frozen products it is important that the food item be thoroughly thawed before being presented for feeding. It is preferable that food is defrosted slowly, perhaps overnight, in a refrigerator or if time is limited in room temperature water. Although freezing can help to kill some harmful bacteria, it is important to remember that some nutrients and vitamins are lost in the freezing and defrosting processes and vitamin supplementation may be required.

Quarantine

Any bird of unknown origin, posing potential disease risk or has had exposure to other potentially sick birds must be placed in quarantine for a period of 1 month before being placed with or near other birds or released. During which time close observation, disease testing, treatment, deworming and vaccination may be carried out. The only exception are birds from a known wild source that have been temporarily stunned or trapped and are suitable for immediate release.

Release

All animals including birds should only be released into their native habitats and home ranges, or within their normal migration routes. Before release, a final physical examination is conducted to confirm that the bird has full use of its limbs, any previous injuries have healed sufficiently, that it is fully waterproof and can sustain flight without tiring quickly.

Birds must be released into an appropriate habitat type for the species. A suitable habitat is one that provides food, water, and shelter and is not over populated. Post release monitoring should be conducted whenever possible. The bird can be fitted with a variety of different identification marking indicators from expensive satellite or radio transmitters to inexpensive coloured and numbered leg rings. Such monitoring can be quite time consuming and is often conducted by bird researchers, experts and enthusiasts.

CHAPTER FOUR

GUIDELINES FOR BIRDS OF PREY

Restraint

When handling raptors gloves should be worn. They should give adequate protection as well as allow the handler to feel what he or she is doing. Special attention is paid to the powerful feet as well as to the sharp bill.

To catch a raptor in a cage it is best to use a net. Towels can also be very useful for covering the raptors head and wrapping around the body. Gaining control of the feet is of the highest priority. The best way to hold larger raptors for examination is to hold one leg in each gloved hand with the raptors back against your stomach. Hold the wings in with your forearms. It is essential to minimise plumage damage at all costs. If the raptor is struggling it is often best to hold it by the legs (which are generally robust) and allow the wings to flap freely until you can re-gain control of the body and wings.

Initial Assessment

On admittance, a raptor is given an initial assessment, preferably by a vet. The bird is thoroughly checked including the eyes, mouth, wings, legs and cloaca. An Admission Form is completed to ensure a standard procedure of examination is adopted for all birds. The bird is also weighed. An early assessment of the potential for release or placement should be made and if this possibility is considered low, for example if injuries are very severe, then euthanasia should be considered (Euthanasia Protocol – Appendix 5). The raptor should also be identified but most will respond to the same treatment and food.

Stabilisation

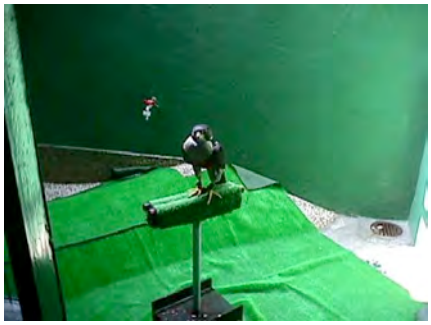
Most raptors admitted will be suffering from shock, dehydration and many are emaciated. The breast muscles and abdomen are checked to determine how thin the bird is and whether there is anything in the stomach. The first course of action is always the administering of fluids either sub-cutaneously or orally. If the raptor is emaciated then initial feeding consists of an easily digestible glucose solution to allow the digestive system to recover. This is followed by roughage-free meat of high quality such as quail breast.

Initial Feeding

Food and water should be offered in plain view of the raptor. Food offered can include whole items such as mice and quail as well as cut up pieces of meat. Chicken and beef is fine for short-term use. If the raptor is fairly fat when admitted it might take 3 or 4 days before it will eat but it is checked daily to make sure it isn't getting too thin or weak. If it is easy to do so without stressing the bird too much, the raptor is weighed daily at this stage. Some raptors will be less inclined to eat if in a small observation box. If a raptor will not eat after some time, and is getting very thin or weak then it is necessary to force-feed. This should only be done after all attempts to encourage normal feeding have failed. One person holds the bird while another carefully opens the beak and pushes a small, moistened ball of meat down the throat of the bird. Raptors normally eat between 5% (larger birds) and 10% (smaller birds) of their body weight everyday. It is important not too overfeed otherwise the bird will never be hungry enough to start eating in captivity.

Initial Housing

Depending on physical condition, raptors may be initially housed in a small, well-ventilated container with solid sides such as a hospital cage or a wooden box. This is to allow observation and treatment of the bird as well as to reduce the chance of feather damage. A minimum size would be about double the height of the bird in all three dimensions. A perch of suitable height to keep the tail off the floor is positioned in the box.



Holding cages are designed to give the raptor space for more movement as well as to allow more hygienic conditions. The bird can perch well above it's droppings on a stand or swing perch. Holding cages should be constructed with minimal wire meshing as this can cause feather damage.

Holding Cages

If the raptor does not need close observation or intensive treatment then it can be put in a holding cage.

Suitable dimensions for holding cages:-

For small raptors e.g. kestrel	3m x 3m x 2m high
For medium sized raptors e.g. buzzard	5m x 3m x 2m high
For large raptors e.g. eagles	6m x 3m x 3m high

Sometimes it is necessary to keep releasable birds in captivity for some time to allow wounds to heal or feathers to moult. It is essential that these birds do not do further damage to themselves because of captivity and so they are housed in cages well away from disturbances. Suitable long-term housing cages should be as large as possible and should feature a sheltered area as well as an open area. This allows the raptor the opportunity to shelter from the elements in times of harsh weather but also allows exposure to rain and the natural climate. Perches of suitable thickness are placed at varying heights within the cage to allow even a weak flying bird to reach the upper branches with the highest perch being within the sheltered area. The highest perch should be positioned at about 2/3 the height of the cage but if the birds flight is very poor then the top perch should be lower to avoid injuries in a fall. The cages are hosed down on a daily basis and more thoroughly cleaned monthly with the use of disinfectants.

Avian quarantine facility

Quarantine

All birds are placed in quarantine for 4 weeks before being placed with or near other birds or released. During this time, they are dewormed and vaccinated. The only time a raptor is not placed in quarantine and released immediately is when it is known to be a wild bird, from a known area that has been temporarily stunned or trapped.

Long-Term Diet

For long-term feeding, raptors are fed whole food such as quail, mice, young chickens and fish. All items are provided as carcasses. A calcium and vitamin supplement should be sprinkled onto the food. Diurnal raptors are fed during the day with leftover food being removed at the end of the day. Owls, which prefer to eat at night, have their food placed at the end of the day, and uneaten food is removed in the morning.

Assessment For Release/Placement

Once the raptor has stabilised from any injury or surgery it may have undergone and is eating in captivity, another assessment for release/placement potential should be made. The following criteria need to be filled for the bird to be placed into either of the categories.

Release Potential

Potential for full flight abilities.
Vision and hearing unimpaired (Full fitness).
Both feet fully functioning.
Not imprinted on humans.
Suitable release site available.

Placement Potential

Suitable placement destination available (with clear conservation and education programme).
Capability of moving around enclosures without injuries or falls.
No chronic injuries or infections.

Birds that do not fall into these two groups should be immediately considered for euthanasia.

Release Methods

Two release methods may be employed, (i) soft release, (ii) hard release.

Soft release

Also known as hacking, involves the use of a small cage and feeding platform in a suitable area in the correct habitat and at the correct time of the year. The bird to be released is placed in this cage for a few days before its release and is fed daily. On the day of its release, the cage door is opened and the bird allowed to fly away in its own time. Food is placed on the feeding platform on a daily basis with the amount taken carefully monitored. If necessary, the food given is carefully reduced to encourage the bird to find food elsewhere.

The soft release method should be used if the raptor being released is a young bird that has no experience in the wild. It may also be used on raptors that are recovering from injuries that have affected their flight ability, and therefore need extra support.

Hard release

Should be used for birds with experience of survival in the wild and which have a satisfactory level of fitness.

Fitness levels are improved by allowing the bird to fly around a large flight cage or by the use of falconry techniques such as high jumping or flying to the lure.

Falconry techniques are very important when rehabilitating large falcons or birds that have suffered from wing injuries, as they allow assessment of flight over long distances.

Hard release is simply a release directly into the wild. The bird is able to fly from its transportation box or from the gloved hands of the handler or placed on a perch such as a tree branch.

Large birds such as eagles may require height and it is often a good idea to release these species from high mountainous ground.

Post-Release Monitoring

Post release monitoring is useful to determine the success of the rehabilitation. The most basic method is the use of leg-bands. Internationally recognisable coded leg-bands can be placed on birds for release, so that data may be collected if they are found or observed later.

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A far more intensive and a more thorough method is the use of radio-telemetry. Radio telemetry is particularly important in monitoring rare species after release, and may enable the interjection of further support if the bird gets into difficulty after release

RAPTOR RELEASE TECHNIQUES SUPPLEMENTARY NOTES

Raptor Fitness Training and Release Techniques Used At KFBG Wild Animal Rescue Centre (WARC)

When a raptor has completed quarantine and treatment, it is then time to think about fitness training and release techniques. Each species, and even each case may have slightly different requirements for fitness training and release and the guidelines below should assist in deciding which technique is appropriate. These guidelines are specific to the species found in Hong Kong and the set-up at KFBG WARC.

A) Determine the Type of Case

The release technique chosen is dependant on the nature of the case.

Type I*:* *Immature/adult birds that were admitted at an age greater than two months post-fledging, without apparent injuries that could affect flight and hunting ability.*

Type II*:* *Juvenile/immature birds that were admitted at an age of less than two months post-fledging, without apparent injuries that could affect flight and hunting ability.*

Type III*:* *Birds of any age that were admitted with an injury that, although resolved, could affect flight and hunting ability.*

B) Release Techniques

Methods may vary slightly from species to species as indicated in the species list below, but the three main techniques referred to are:

Aviary

Fitness and Release

The bird should be allowed/encouraged to fly around a spacious aviary for at least one week for fitness training before release. The bird should then be simply released in a suitable location. If the release site is nearby then the bird should be transported there by hand. If a transportation box is used then the bird may be best released from the box.

Hacking

Two methods.

a) Immediate hacking

If the bird has not reached fledging age then immediate hacking is an option. The fledgling should be placed in an artificial nest and food supplied until the bird can fly and hunt.

b) Conditioning to a release site/feeding platform

The bird should be allowed to reach fledging age with minimal human contact. Then it should be 'manned' and fed on the fist daily until steady enough to be fed on a release platform. The bird should be fed on the release platform for one week before release. Food should be placed on the release platform daily for up to 2 weeks after release of the bird.

Falconry techniques

This includes high jumping, flying to the fist and flying to the swung lure. Relatively inexperienced practitioners may undertake some of these activities but some (e.g. swung lure and weight control of smaller species) need an experienced practitioner.

Flight ability should be assessed throughout the whole training period and if it is evident that the bird has poor ability and that its condition is unlikely to improve in the short term then the bird should be placed back in a flight aviary and possibly be considered un-releasable.

Crested Goshawk, Besra Sparrowhawk, Japanese Sparrowhawk, Chinese Goshawk, Kestrel, Amur Falcon, Common Buzzard, Hobby, Eagle owl, Brown Fish Owl.
Type I: Aviary fitness and release
Type II: Hacking (only if Hong Kong breeding species).
Type III: Aviary fitness and release for birds with minor problems (flight assessment must be undertaken in a large aviary or outside on a line). Falconry Techniques should be used in more serious cases.

All Owls Except Eagle owl and Brown Fish Owl
Type I: Aviary fitness and release.
Type II: Aviary fitness and release (only if Hong Kong breeding species).
Type III: Aviary fitness and release.

Black Kite
Type I: Aviary fitness and release.
Type II: Hacking
Type III: Falconry techniques. Suggestions for black kite falconry techniques;
The bird should be manned and fed on the fist daily.
It should be flown on a line to the glove up to a distance of 5 metres and then flown to a lure (or food on the ground) and trained to fly from the ground/lure to the fist.
Once the bird is doing this, the length of flight to the lure (or food on the ground) should be increased to 30 metres. When the bird has been doing this well for one week and has been flown from a high tree, it should be flown without a line. Over the next few days the bird should be flown free over distances that are as large as possible or for as long as possible and if flight ability seems perfect then it should have jesses removed and be released. Post release feeding should be provided if necessary.

Peregrine Falcon, Saker Falcon
Type I: Hacking or falconry techniques.
Type II: Hacking or falconry techniques (only if native breeding resident)
Type III: Falconry techniques including swung lure.

White-bellied Sea Eagle, Crested Serpent Eagle, Bonelli's Eagle, Imperial Eagle, Spotted Eagle
Type I: Aviary fitness and release followed by post-release monitoring.
Type II: Hacking (only if native breeding resident)
Type III: Falconry Techniques.

VETERINARY ASPECTS OF RAPTOR REHABILITATION

Introduction

Effective rehabilitation involves input from many people, each with their own area of expertise. The veterinarian is part of a team and veterinary medicine and surgery are part of a process to rehabilitate and ultimately release a bird back to the wild.

Wild birds are particularly challenging, they will usually be presented with an unknown history and may mask signs of disease as part of their 'self preservation instinct'. The excitement and stress of unfamiliar surrounding may make a bird appear healthier than it really is. About 50% of birds entering the rehabilitation programme at KFBG are released. Be prepared for losses and be prepared to euthanize immediately if the presenting problem is obviously not compatible with release back to the wild.

Transport

Birds should be transported in secure, darkened and well-ventilated boxes. Flooring should contain material to allow the bird to grip. Size should not be too large as the bird may flap its wings and induce injuries due to panic behaviour. Boxes should be cleaned or disposed off and not stored in a damp environment as this will allow build up of pathogens especially *Aspergillus sp.*

Arrival

Upon arrival, the bird is directly transferred to a holding cage / box. During this transfer, a cursory inspection is made to ensure no immediate veterinary attention is required. The bird is then allowed to settle for about 10 minutes, to allow recovery from the stress of handling and transport. It also makes assessment of respiration more realistic. During this period, one has the opportunity to obtain a history from the organization or the individual handing the bird over. Questions such as location (i.e. found in oiled water, near a nest), previous treatment (may have been referred by another clinic or concerned individuals), and the persons contact details (should further questions arise) will provide valuable information.

Initial Assessment

It is important to remember that wild birds brought into the hospital have failed the test in the wild and even if the problem is not immediately apparent, there will be some underlying problem. The bird may be an orphan, exhausted, suffering from trauma or have been exposed to poisoning or oil.

Orphaned Birds

These are birds that have strayed and fallen from the nest. These nestlings should be returned to the nest as soon as possible if the site can be located. The decision to keep and hand raise an orphan should not be made lightly, the bird may require intensive feeding (depending on age) and imprinting may leave you with a bird that cannot be released back to the wild.

Exhausted Birds

Young birds may be inexperienced feeders or may have been pushed out of their habitat during the dispersal stage of the breeding season. Adults may have faced inclement weather, be

exhausted after migration, have experienced a decline in prey species, have visual defects preventing food capture, suffered trauma or may have been exposed to toxins or disease.

Trauma

This is a very common presentation. Whatever the form of trauma, it has debilitated the bird to the extent that it could be captured. It will usually be weak and emaciated (depending on the trauma time frame).

Distance Examination

It is important to start the examination before handling the bird. This allows assessment of some parameters that cannot be assessed as well during restraint (such as posture, demeanour, lameness, and resting respiration).

Distance examination may allow detection of subtle problems such as a tail bob indicating laboured breathing, or a dropped wing suggesting a musculoskeletal problem (e.g. a fracture).

This will allow modification of the approach adopted to restrain the bird i.e. a bird displaying laboured breathing may be put into an oxygen rich environment PRIOR to restraint to minimize acute respiratory compromise, collapse and even death.

Physical Examination

A full physical examination will require restraint**.** In turn this requires consideration of the handler's safety from talons and beaks and consideration of the birds stress level and ability to breath (do not restrict chest movements). Always be prepared to stop the examination and put the bird down if it becomes excessively stressed (may decide to anaesthetize), or suddenly weak during examination. A bird may collapse during examination necessitating emergency protocol. The system of examination should be based on own preferences, as long as it is methodical, and systematic, so all organs or structures are examined.

Initial Therapy and Diagnostics

Fluid therapy

Most wild birds will be experiencing some degree of shock, dehydration and circulatory collapse on arrival at the WARC.

We assume all birds are 10% dehydrated. A variety of fluid solutions are available, but usually one will have to institute fluid therapy before any clinical pathology results are available.

Lactated Ringers or Hartman's solution is an ideal initial choice. These will correct electrolyte and fluid deficits and mild acidosis. These fluids are isotonic so they will not draw fluids out of cells by osmosis. They contain few calories so animals not eating may need to have supplemental calories.

If dextrose is added by intravenous (IV) or subcutaneous (SQ) route, ensure it is not greater then 3% or it will be hypertonic and draw fluid out of cells. Dextrose 5% in Lactated Ringers is a balanced electrolyte solution but should only be administered IV or orally, if given SQ it will draw interstitial fluids out into the subcutis increasing dehydration. Also, beware giving per os (PO) as this will draw fluids into GI tract, therefore do not use in severely dehydrated birds.

Administering 5% dextrose mixed with Lactated Ringers provides 2.5 % Dextrose, which can be given by SQ, IV PO and will provide animals with some energy. Fluid therapy can be modified later based on biochemistry, electrolytes, PCV, TP etc.

Route of fluid therapy
Choices include IV, intra-osseous (IO), SQ, PO, and intramuscular (IM). Never use intra-peritoneal (IP) due to presence of air sacs in birds.

Severely debilitated birds e.g. laterally recumbent, may require rapid fluid replacement. The IV route is usually the best. IV can be via the R jugular, ulnar, or medial metatarsal veins. A rapid bolus IV @ 10 ml / kg / min can be administered. If the bird is in extreme shock or circulatory collapse it may be difficult to access veins (collapsed), cutting down to jugular could be attempted. Alternatively use IO. The needle is inserted into the distal ulna or proximal tibia. The same rate as IV is followed. For birds not requiring such rapid replacement the SQ route is usually the best, it requires a bit less restraint and thus less stress to the bird. It can also provide quite large volumes. Never give more than 10cc/kg in one site. Sites available include inguinal and lateral flank. Avoid the neck due to cervicocephlic air sacs.

The SQ route is commonly used for ongoing maintenance fluid therapy. The oral route can also be used for ongoing maintenance, but should never be used in birds that are vomiting or severely debilitated. The tube is passed to the right of glottis; palpate neck to ensure the tube is not in trachea. If when palpating trachea, a second rigid tubular structure is located, the tube is located properly in oesophagus. If only one tube located, check location of tube before administering fluids.

Volume of fluid
Fluid therapy has to replace the deficit (previously stated, assume 10%) and meet the daily metabolic losses known as maintenance which is assumed to be 50 ml / kg / 24 hrs.

Therefore deficit requirements are % dehydration x body weight (g) = fluid deficit in millitres (mls). Normally replace 50% of the deficit in first 24 hours, and the remainder over the next 48 hours, whilst providing maintenance needs.

For example -
Patient: Eagle Owl presents with a fractured wing.
Body weight 3 kg
Estimated to be 10 % dehydrated.
Fluid requirements:
Deficit: 3,000g x 10/100 (10%) = 300 mls
Maintenance: 3 x 50 = 150 mls / day (50% deficit)
Plan: Day 1: 150 mls (50 % of deficit) + 150 mls (maintenance)
= Total 300 mls ⇒ Administer 65 mls 4-x day.
Day 2: 75 mls (25 % of deficit) + 150 mls (maintenance)
= Total 225 mls ⇒ Administer 56 mls 4 x a day
Day 3: As for day 2.
Note: If there are significant on going losses such as severe diarrhoea or vomiting, these need to be factored and relevant replacement calculated. Birds in severe shock may need colloid or blood. Colloids such as dextran contain large molecules that will be retained in vascular space thus drawing fluid from interstitium, so they can restore blood volume without aggravating hypoproteinaemia or causing pulmonary oedema in animals with hypoproteinaemia and low oncotic pressure.

Nutritional support
- Some birds are unable initially to accept oral fluids and nutrition, but may be able to go on to solids within 24 hours. Therefore rehydrate with 2.5% dextrose solutions and once hydrated they can be given 5% dextrose orally. This can even increase until one starts providing more complex

foods i.e. move to Critical Care Formula (CCF) (Maltodextrans and amino acids) and then blended meat gradually.

Severely emaciated and dehydrated birds will be severely debilitated and carry guarded prognosis. Correcting fluid deficits with 2.5% dextrose solution will provide some calories. Need to give IV for best response. Solid food at this point will probably kill the bird. Most important factors are fluids, heat and dextrose. Even A/d will be too much at this stage. If later the bird can accept oral fluids, then can use higher concentration dextrose solutions. Gradually move to products like CCF (easily assimilated from gut with little energy expenditure from the bird).

Commercial products like Hill's A/d or Critical Care Formula (CCF) or various recipes exist for homemade diets

May need to administer Metoclopramide (2 mg / kg IM), if the bird is regurgitating or crop stasis exists.

Regular smaller feeds recommended rather than single large feeds if the bird is not self-feeding to avoid development of sour crop.
Once an assessment has been made that the bird can process solid or semi solid food, one can begin providing slurry of blended meat, there is no need to feed casting material to sick birds (bone and feathers).

Formulas exist for calculating energy requirements. Remember disease and illness produces a hyper metabolic state.

Other commonly used therapies -
Antibiotics
Corticosteroids: controversial.
Iron: useful for anaemic patients. Not with sepsis as iron is an important growth factor for bacteria.
Vitamins
Fat-soluble (ADEK): Stored in body and toxic at high levels.
Water-soluble: Rare to see deficiency in wild birds. Not stored in body.

Sick birds must be maintained at appropriate temperatures so they do not expend energy maintaining body temperature. An ambient temperature of 30 degrees or even higher may be needed. Ensure humidity is adequate or heat may dehydrate the bird. Birds with oil / feather damage will suffer even greater body heat loss. Normal body temperature in birds is between 40 - 42 degrees.

Diagnostics

- Working with injured wildlife requires some degree of competency in basic laboratory procedures and their interpretation.

Blood testing - 1 % of body weight is safe to withdraw from an animal, i.e. from a 1 kg bird can withdraw 10 mls and from a 100 g bird 1 ml.

The blood should be placed in an EDTA tube (Purple top) and a smear made ideally from the blood before added to EDTA for haematology. Blood for biochemistry should be placed in a Lithium Heparin tube (Green top) and blood should be spun down in microhaematocrit capillary tubes for PCV and TP assessment. If minimum blood is available then priority would normally be PCV, TP, blood smear and if enough available LiHep for biochemistry.

Blood smears should be examined for RBC morphology, parasites, estimated white cell count (EWCC).

An EWCC is performed by examining 10 high dry fields (x40) and counting the leukocytes. Divide the number by 10 to get average and then multiply by 2000. Need to correct for PCV by multiplying by observed PCV / Normal PCV (usually estimated to be 40).

Estimated white cell count
Number white cells in 10 fields @ x 40 magnification / 10 x 2000 x Observed PCV / Normal PCV = number of cells/µl.

A PCV below 32% suggests anaemia and above 58% dehydration (or polycythaemia). Dehydration may mask the anaemia initially, and a follow up PCV after rehydration might reveal the true PCV. RBC morphology may help identify the anaemia.

Plasma proteins can be estimated with a refractometer, while accepted not very accurate it will give a quick estimation. Elevated TP with normal A/G ratio is expected with dehydration. Also consider inflammation, therefore albumen / globulin ratio and absolute values important. Gastrointestinal, renal and hepatic disease can cause severe hypoproteinaemia as will severe emaciation.

Faecal analysis - Faeces should be analysed for parasites and one can also do faecal gram stain. Faeces are directly examined on the slide with a drop of warmed saline and a cover slip for protozoa detection. A faecal float is performed to detect presence of worm eggs.

Bandaging

The joint above and below the fracture must be immobilised.
The most common bandage employed is the figure of 8 bandage. While seldom used for final stabilization of fractures it provides initial support while the patient is stabilized. May decide to perform under GA to minimize further damage especially to soft tissues.
Metacarpal, no joint below, only carpus needs immobilizing therefore figure 8 wrap only.
Radius and Ulnar - below is the carpus and carpo metacarpal joint and above the elbow therefore as above.
Humerus - shoulder above and elbow below therefore body wrap.

Beware tendon contraction, try to remove ASAP – patagial membrane and joint stiffness. 2-3 weeks max.

Address underlying wounds.

CHAPTER FIVE

GUIDELINES FOR AMPHIBIANS AND REPTILES

Initial Housing

Simple housing for reptiles under treatment and quarantine. Easy to clean and hygienic conditions

All newly admitted herpetofauna should be subject to a quarantine period of three months, or longer if obviously diseased on arrival. Animals with severe trauma and disease will have to be housed in an 'intensive care unit'; a very basic and hygienic enclosure which the vet or person in charge can have easy access to during the treatment of the sick animal. It is recognized by international rescue centres and herpetoculturists that herpetofauna can adapt very well to fairly small enclosures. Rescue centres occasionally have to accept and maintain a large number of herpetofauna at very short notice when seizure of illegal animals has taken place. For the above reason it is advisable to provide a quarantine enclosure with basic facilities. Many herpetofauna do extremely well in artificial and "hygienic" captive environments, as long as other environmental parameters (such as heat and humidity) are optimum for the species. For example, newspaper is a very cheap, sterile and absorbent substrate for terrestrial species, and can be utilized for some reptiles particularly during quarantine and periods of temporary holding.

The correct captive environment (temperature gradient, UV light, humidity etc.) must be prepared for the species concerned. All quarantine enclosures should be at the correct temperature range and it is essential for ALL enclosures to have a **drinking source** and a **hiding place**, since most herpetofauna on arrival are dehydrated and stressed. The water container should not be too large or too deep to minimise the chances that the weakened animal may drown. Terrestrial reptiles should be housed in a simple, uncluttered enclosure. Arboreal species should be offered suitable climbing objects, many arboreal species are much happier when they can rest on a high point. Freshwater aquatic species and most amphibians must have an enclosure filled with clean freshwater, the base of the water section can be bare or have a few pebbles scattered. A dry land area must be available so that the animal can have a rest and remain dry. There should be two hiding places for semi-aquatic species; one in water and one on land. For other terrestrial amphibians such as toads (e.g. *Bufo sp.*) and salamanders (e.g. *Tylototriton sp.*), the enclosure should consist of a shallow water dish and moist fallen leaves or sphagnum moss as the substrate. The choice of suitable hiding places for amphibians and reptiles is endless, provided that thorough disinfection and cleaning is possible. Examples of artificial hiding places include halved flowerpots, split-open PVC tubes and a card-box with entrance hole.

To prevent a nervous or aggressive specimen from injuring itself by trying to escape or striking at the enclosure when disturbed, it is a good idea to keep the rescued animal in very dim light, or total darkness initially. This can be achieved by leaving the animal in a dark room or by covering the enclosure with newspaper or cloth. Most herpetofauna are much more relaxed when they are in a dark and quiet environment, after being placed in new surroundings.

Food can be offered to the animal when it has settled down. It may be surprising to learn that more than 50% of rescued herpetofauna will immediately start feeding even after the trauma of being captured and transported; it is especially true for most snakes and lizards. However, for reptiles that take large food items (e.g. monitor lizards and pythons), the correct ambient temperature must be available, and there should be no contact with the animal for at least the next 24 hours, otherwise food may be regurgitated.

After quarantine, if the specimen shows no sign of any illness and has begun feeding, a larger enclosure with environmental enrichment can be considered. The rescue centre then has to decide what is the best future for the animal concerned (i.e. placement for captive-breeding, or re-release).

Temperature and Lighting

Some examples of a combined UV and heat lamp set up to provide a temperature gradient. The picture on the left is set up for an aquatic turtle and the picture on the right is set up for a lizard

Good control of ambient temperature and lighting is a major requirement for successful reptile and amphibian husbandry. In tropical and sub-tropical countries with humidity between 70-100% for most of the year, the humidity is usually of no concern to most herpetofauna except some desert and temperate species. Rescue centres that are situated in sub-tropical or temperate regions, may have to deal with animals admitted during winter, which suffer from respiratory diseases such as pneumonia. It is necessary to provide a thermal gradient for herpetofauna, since this is how they survive in the wild as ectotherms. The problem is easily solved if the species concerned are native, thermal regulation can be achieved by simply leaving the windows open where they are housed to get natural ambient temperatures. However, be aware of their natural behaviour in the wild during winter. Feeding may not be necessary during most of the winter period for some species. The natural fluctuation of the local weather will be sufficient for the animals to carry out their normal physiological activities.

For species fond of basking, such as most lizards and chelonians, it is essential to provide a basking spot with UV output in the enclosure. It is suggested that a spot lamp with suitable wattage matching the size of the enclosure is employed in order to provide the thermal gradient. However, it can be impractical to house every specimen in an enclosure large enough to allow the animal to perform thermal regulation; it is better to place a number of enclosures in a room with the desired ambient temperature. For species for which basking is fundamental, a spot lamp

can be used for each enclosure in a rota fashion, an hour under the basking spot should be enough for most reptiles to pursue their normal activities.

A UV heat bulb provides both UVA and UVB, and heat for the basking reptile.

For amphibians, it is not necessary to provide a basking spot as long as the ambient temperature is within the species optimal range for body functioning. A combination of high temperature and low humidity can actually kill most amphibians very rapidly.

Light requirements differ among different groups of herpetofauna. The best way to ensure that animals receive the right amount of UV radiation is to allow the animals free access to natural sunlight, provided that the air temperature is within the species' preferred range. It is especially important to have plenty of ultraviolet radiation for the physiological as well as psychological needs of chelonians, lizards and some diurnal snakes (e.g. *Elaphe sp.*). If direct sunlight is not available, because of air temperature in winter or inadequate facilities, it is essential to provide UVA and UVB radiation in the form of commercially available electrical fluorescent tubes or bulb products.

Furnishing

Despite the fact that most herpetofauna do well in an artificial set up with virtually no natural objects, it is beneficial to carry out certain environmental enrichment techniques. Most herpetofauna will benefit from simply putting a few sterile branches and rocks in the enclosure, since this will greatly increase the surface area an animal can utilizes in its enclosure. The time and energy an animal spends investigating and climbing these objects may prove valuable to the health and well-being of the animal in long-term captivity. For enclosures with newspaper as a substrate, it is particularly useful since most reptiles find the smooth surface of newspaper rather difficult to get traction on. It has been suggested that reptiles living in enclosures with newspaper bottom may develop degeneration of leg muscles.

Note the use of a cinder block, heat and UV lamps, PVC pipe hide, branch, dried leaves and Astroturf for furnishing

If other substrate is preferred over newspaper, make sure the particle size is not too small so that the animal may accidentally ingest mouthfuls when feeding. It is common to find intestines fully packed with soil or other small objects (e.g. peat moss or fine sand) in post-mortems of herpetofauna. The water section can be extended and improved with aquatic plants and emerging boulders if the species is a good swimmer (e.g. most amphibians and aquatic reptiles). Aquatic and semi-aquatic turtles and lizards enjoy the cooling effect and security of a muddy pool, although one must be careful about the source of mud, commercially available 'pond-mud' is a good choice.

put the animals at ease while in captivity

Many semi-aquatic lizards (e.g. *Physignathus sp.*) and snakes (e.g. *Sinonatrix sp.*) will rest on overhanging branches above their water pool, if available. Live plants can be placed in enclosures, especially for amphibians and smaller reptiles, they provide more moisture and hiding places as well as a climbing structure. Tree frogs (e.g. *Hyla sp.*) and Iguanas (e.g. *Iguana iguana*), for example will prefer to rest on green leafy plants rather than bare dead branches. Again, the way of improving the captive condition depends heavily on the species' requirements and the materials available to the rescue centre. Some plastic imitation plants may be suitable additions to an enclosure.

Feeding

Although non-living food is recommended by many authors for feeding all captive herpetofauna, with the advantages of good hygiene and no risk of prey injuring the animal being fed**,** there are some individuals and groups that will only take live food. Most amphibians (except some aquatic caudata), especially anurans, and carnivorous lizards (except monitors *Varanus sp.*) will only voluntarily eat live and moving prey items, but dead food is only taken when the feeder manually simulates the movements of the prey. It may be acceptable to private collectors or organizations with few specimens, but is not really practical where large collections of animals have to be cared for on a daily basis. Snakes and turtles, however, present little problem when feeding with pre-killed food, with the exception of fish-eating and amphibian-eating snake species. It is known that sometimes reptiles (e.g. Boids, Varanids and some Chelonians) fast for a periods without any apparent damage to their health, it is thought that even if all environmental parameters are maintained, the biological clock of certain species may trigger the natural dormancy stage of the species. However, if a specimen has been offered pre-killed prey, and it refuses to feed for a prolonged period, it may be worth trying to offer live prey. Some individuals will only take live prey for a period, and switch to accepting dead food later.

Offer as wide a range of food items as possible to assure a well-balanced diet. If the prey choice is restricted to a limited range, the food must be sprinkled with commercially available vitamin/mineral supplement or a fine grade bone meal. Commercially prepared processed foods are available for many species nowadays, but the long-term implications of such a diet are still unknown.

Health Care

The husbandry of herpetofauna is straight forward if one knows the individual species' requirements. As long as the captive conditions can provide the correct temperature range and humidity, a balanced diet and clean environment, most herpetofauna will do well in captivity. However, a few common diseases are encountered, such as internal and external parasites, viral and bacterial infections, fungal and protozoan diseases. The rehabilitator should keep a close eye on all specimens at all times, the first indication of a sick animal is lethargy, prolonged periods under or on a heat source and loss of appetite. Seek the help of an experienced vet for immediate treatment since the disease is usually relatively severe once detectable. Detailed veterinary procedures for various diseases is beyond the scope of this article, consult other literature on this topic if a qualified vet is unavailable.

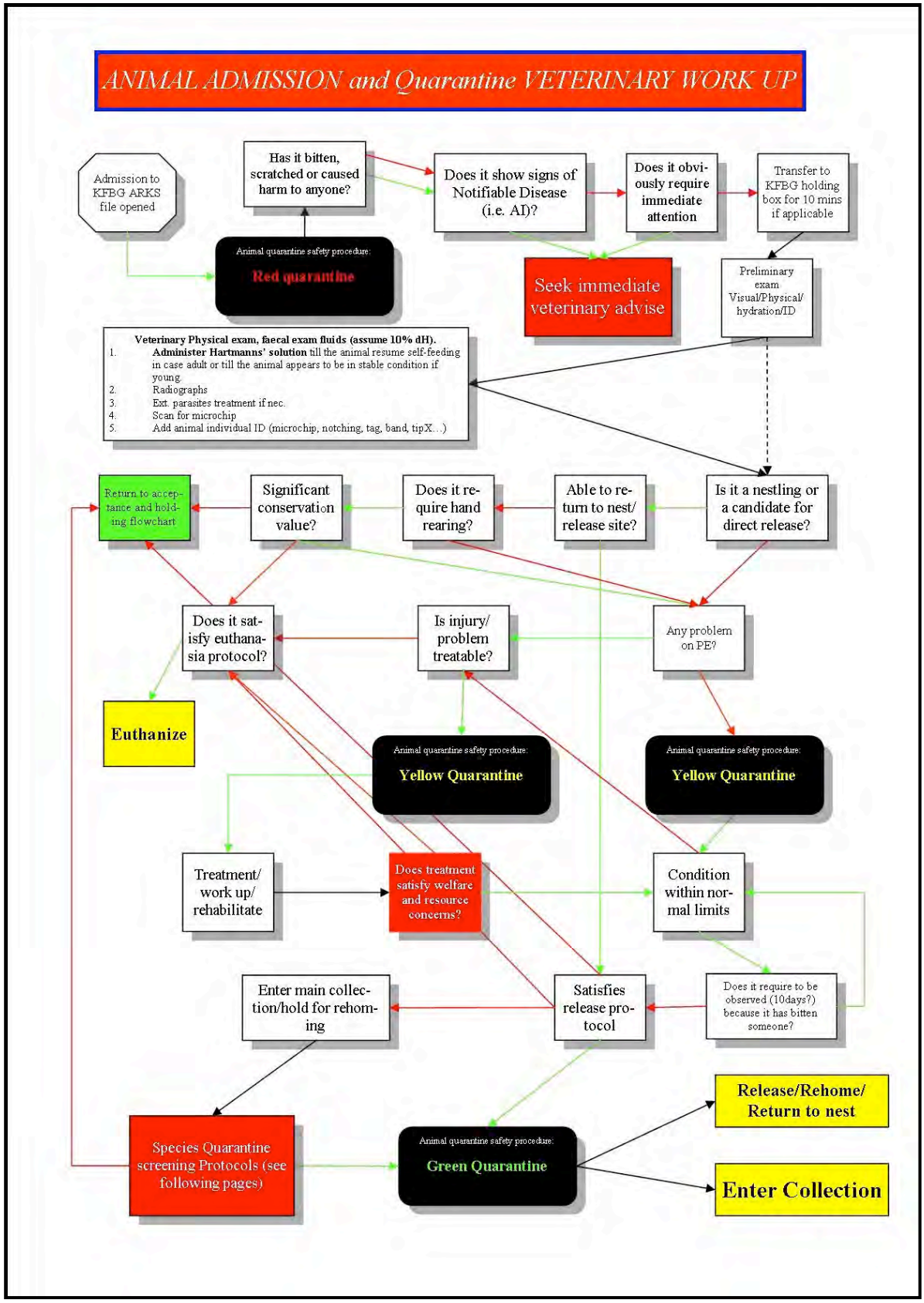
Options For Recovered Herpetofauna

After the animal has fully recovered, it is important to decide what the best long-term future is for the particular individual concerned, the conservation value of an individual species must be a priority consideration by the rescue centre. There are generally three options for rescued animals: 1) Lifetime in captivity (for education, or conservation breeding) 2) Wild release 3) Euthanasia. There have been many discussions concerning this issue by experts all over the world, there are advantages and disadvantages related to each option. The final decision has to be made on a case-by-case basis, whatever the decision, it must be the best option that considers the welfare of the individual and contributes toward the conservation of the species concerned. It is wise to take the euthanasia decision early on, soon after the reptiles' arrival at the rescue centre, as this would minimise time and resource wastage later.

CHAPTER SIX

VETERINARY ASPECTS OF WILDLIFE RESCUE

Animal Admission and Quarantine Veterinary Work Up



Avian Quarantine and Annual Screening

Avian Quarantine Screening

1 Month Quarantine Period

Procedures required:

1. Radiographs
2. CBC, Bioch
3. Chlamidia (if nec)
4. DNA sex (MIL lab HK)
5. PBFD (if psittacine) (MIL lab HK)
6. Salmonella cloacal swab
7. AI titer (if applicable) (AFCD Gov. Lab. HK)
8. AI choanal/cloacal swab
9. Two deworms (Fenbendazole 50mg/Kg ORALLY) and 2 faecals 2 weeks apart (if not released earlier)
10. Body weight check
11. Identification (microchip, leg bands etc)

Avian Annual Screening

Procedures required:

1. A samples of the birds per year (if not all):
   Radiographs
   CBC, Bioch
   Chlamidia (if nec) (MIL lab HK)
   DNA sex (if nec) (MIL lab HK)
   Salmonella cloacal swab
   AI blood titer (if applicable) (AFCD Gov. Lab. HK)
   AI choanal/cloacal swab (if nec.)
2. All birds:
   One deworm:
   Fenbendazole 50mg/Kg ORALLY
   Treat for external parasites
   Body weight check
   Identification check

Avian Influenza Testing and Positive Result Response

Avian AI Testing and Positive Result Response

- All birds coming thought the WARC during the AI sensitive period (Nov-May) will be tested for AI with either/or cloacal and choanal swabs to be sent the Gov. Lab.
- All dead/euthanized birds, who did not have a previous negative AI result, will be sent to the Gov. Lab. for AI testing.
- All dead chickens will be delivered to the WARC. Placed outside the VH and awaiting for disposal:
- Sentinel chickens> will be sent to the Gov. Lab. (point out on the Lab Form "non AI-vaccinated")
- Non Sentinel chickens> veterinary discretion to send them to the Gov. Lab (point out on the Lab Form "AI-vaccinated")

A bird coming through the rescue centre may be asymptomatic, but test POSITIVE for Avian Influenza (Gov. Lab).
A prompt response is expected from AFCD, but the immediate Farm Staff Response (FAU response) should be:

1. Open a conversation channel with AFCD
2. Make the room/ward where the bird is presently housed a HIGH QUARANTINE ROOM (RED Quarantine).
3. No staff are allowed to enter in without direct permission from the Vet/HD/HD substitute.
4. No animal movements are allowed in-out the room.
5. No transfer of tools/cages/instruments are allowed in-out the room.
6. Isolate all animals who have been in contact (even briefly) with the affected bird
7. High biosecurity measures should be put in place (masks, gloves and wet mats) for that room.
8. Do a survey of all the staff who has been in contact with the affected animal and follow suggestions from AFCD/Hygiene Dpt. For eventual isolation/testing.

Reptilian Quarantine and Annual Screening

Reptilian Quarantine Screening

3 Months Quarantine Period
(to be prolonged if necessary)

Procedures required:

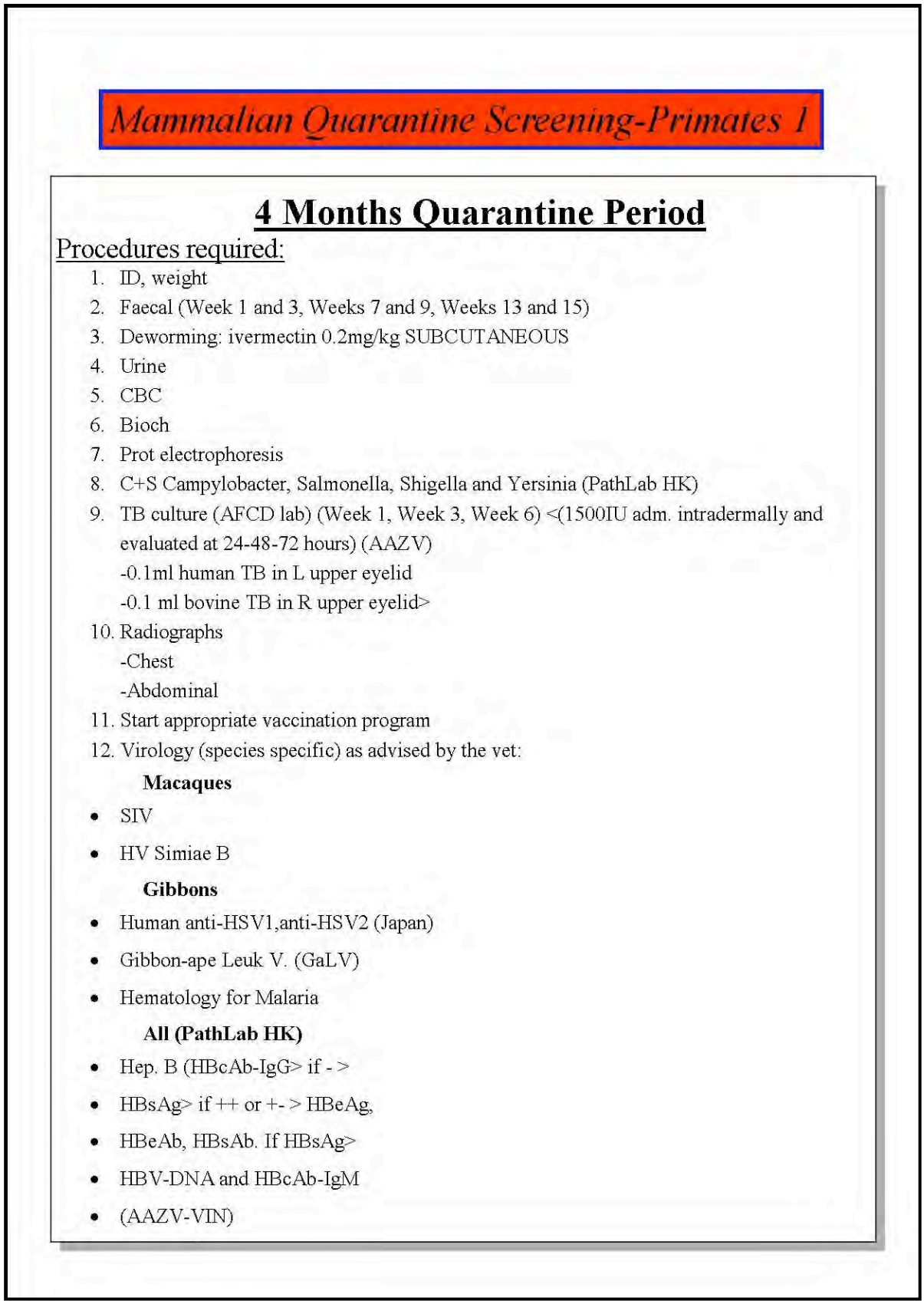
1. Two Worming, 4 weeks apart
   - Fenbendazole 100mg/Kg ORALLY (25mg/Kg in pythons)
   - Metonidazole 100mg/Kg ORALLY
   - Praziquantel 8mg/Kg INTRAMUSCULAR
2. Three negative faecal examinations alternate with the worming
3. Treat for external parasites
4. Salmonella culture (all the animals or a sample of them)
5. CBC (smear), Biochemistry and Blood smear for parasites (if necessary)
6. Swab/nasal wash for Mycoplasma detection (Culture) (MIL lab HK)
7. Radiographs
8. Chelonian Herpes (ChH) DNA test (MIL lab HK)
9. Body weight check
10. Identification (Microchip etc)

Reptilian Annual Screening

Procedures required:

1. A samples of the Reptiles per year (if not all):
   - One worming
   - Fenbendazole 100mg/Kg ORALLY (25mg/Kg in pythons)
   - Metonidazole 100mg/Kg ORALLY
   - Praziquantel 8mg/Kg INTRAMUSCULAR
   - Biochemistry and Blood smear for parasites (if necessary)
2. All Reptiles:
   - Radiographs for a sample of animals
   - Body weight check
   - Identification check

Mammalian Quarantine Screening For Primates



Mammalian Annual Screening and Vaccination For Primates

Mammalian Annual Screening– Primates 2

Procedures required:

1. Identification check
2. Body weight
3. CBC, Biochemistry, Blood smear, urine
4. Rectal culture for enteric pathogens: SALMONELLA, SHIGELLA, CAMPYLOBACTER and YERSINIA
5. Faecal examination
6. Lateral thoracic radiographs
7. V/D and LAT abdominal radiographs
8. TB skin test: 0.1 mammalian old tuberculin (MOT) or human tuberculin intradermally in Left upper eyelid. Check for swelling at 24-48-72 hrs. Bovine tuberculin 0.1ml in Right upper eyelid for comparison.
9. (Tracheal wash and/or (gastric wash) and/or rectal swab for cytology and TB culture) (if necessary).
10. Deworming: ivermectin 0.2mg/kg SUBCUTANEOUS
11. (fructosamine, glycosylated haemoglobin, and insulin levels for diabetics)
12. **Viral testing according to the species and status** (if necessary)
13. Vaccination as per following protocol

Mammalian Vaccination Protocol– Primates 3

- **TETANUS TOXOID**
  adsorbed human product 0.5ml SUBCUTANEOUS:
  - at 3-6-9 months of age and then every 3-5 years
  - or 2 vaccinations 4-6 weeks apart and the after 6-12 months. 5 years apart thereafter.

- **RABIES**
  1ml of human vaccine every 3 years or as per manufacturer instructions

- **HEPATITIS B** (gibbons with negative titer)
  follow the human protocol

- DPT/MMR/Measles/POLIO (if necessary)

Mammalian Quarantine Screening For Non Primates

Mammalian Quarantine Screening - Non Primates

4 Months Quarantine Period

Procedures required:

1. Identification, body weight check
2. Faecal (Week 1 and 3, Weeks 7 and 9, Weeks 13 and 15
3. Urine
4. CBC
5. Biochemistry
6. C+S Campylobacter, Salmonella, Shigella and Yersinia (PathLab HK)
7. Radiographs
   -Chest
   -Abdominal
8. Deworming: ivermectin 0.2mg/kg SUBCUTANEOUS
9. Or Fenbendazole 50mg/Kg ORALLY
10. Start appropriate vaccination program

Animal Admission and Fluid Therapy

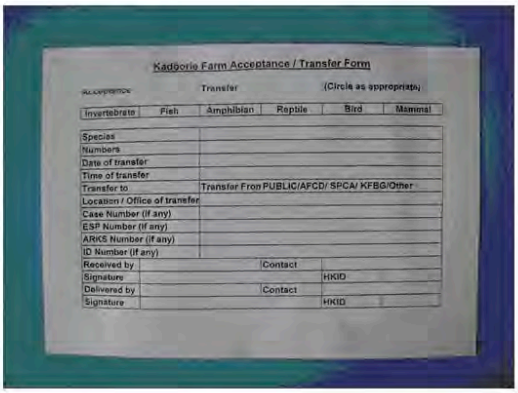
Animal Admission and FLUIDOTHERAPY

Admission

REFER TO THE RELEVANT ADMISSION FLOWCHART AND CONTINUE BELOW...

At the time of admission, 2 forms are needed:

- Acceptance Form (universal form) (to filled front and back)

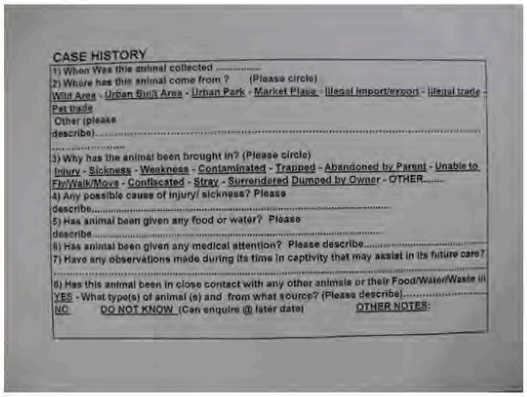


Kadoorie Farm Acceptance / Transfer Form

Transfer (Circle as appropriate)

Invertebrate	Fish	Amphibian	Reptile	Bird	Mammal

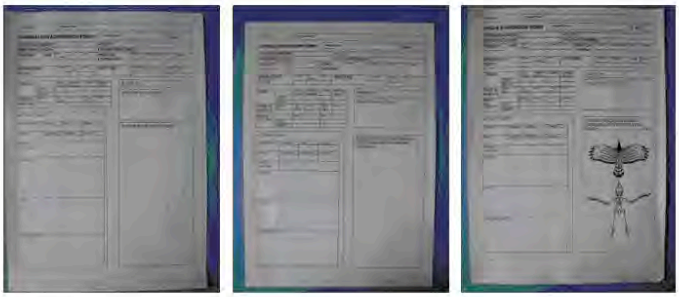
Species	
Numbers	
Date of transfer	
Time of transfer	
Transfer to	Transfer From PUBLIC/AFCD/ SPCA/ KFBG/Other
Location / Office of transfer	
Case Number (if any)	
ESP Number (if any)	
ARKS Number (if any)	
ID Number (if any)	
Received by	Contact
Signature	HKID
Delivered by	Contact
Signature	HKID



CASE HISTORY

1) When Was this animal collected .....
2) Where has this animal come from ? (Please circle)
Wild Area - Urban Built Area - Urban Park - Market Place - Illegal import/export - Illegal trade - Pet trade
Other (please describe).....
3) Why has the animal been brought in? (Please circle)
Injury - Sickness - Weakness - Contaminated - Trapped - Abandoned by Parent - Unable to Fly/Walk/Move - Confiscated - Stray - Surrendered Dumped by Owner - OTHER.....
4) Any possible cause of injury/ sickness? Please describe.....
5) Has animal been given any food or water? Please describe.....
6) Has animal been given any medical attention? Please describe.....
7) Have any observations made during its time in captivity that may assist in its future care?
.....
8) Has this animal been in close contact with any other animals or their Food/Water/Waste ie
YES - What type(s) of animal (s) and from what source? (Please describe).....
NO DO NOT KNOW (Can enquire @ later date) OTHER NOTES:

- Admission form (per specific animal group i.e, birds, mammals, reptiles)



2. The acceptance form has to be SIGNED by the person/institution (member of public/SPCA/AFCD) who surrenders the animal and also SIGNED by the KFGB staff member receiving the animal.
3. A visual check of the animal is performed immediately upon arrival.
   If the animal is UNSTABLE:
   AVIAN> signs of AI? Call the vet!
   Medical/surgical emergencies> call vet
   Stress, panting, panic...> rest for 30 minutes> recheck> call the vet?
5. When the animal is stable the full admission check (following all steps on the admission form) and should be performed and fluids administered following the below regime.
6. The animal can then be relocated to temporary holding box/cage
7. A medical, husbandry and feeding plan should then be formulated
8. The case should be updated on the relevant section whiteboard
9. An ARKS record should be opened and any other relevant paperwork updated.

Fluidotherapy

AVIAN
DAY 1, 5% body weight twice a day (=twice a day) SUBCUTANEOUS (=subcutaneous) Hartmanns' solution (Fig. 4),
DAY 2-3, 3.7% body weight twice a day SUBCUTANEOUS Hartmanns' solution (or Lactate Ringer)

DAY 1 Weight (grams) x 5 ÷ 100 = ml of fluids
E.g.: 1 Kg bird → 1000 x 5 ÷ 100 = 50ml of fluids

DAY 2-3 (if necessary)
E.g.: 1 Kg bird → 1000 x 3.7 ÷ 100 = 37ml of fluids

REPTILE
Re-hydrate ALL REPTILES in warm shallow water (25-30 degrees) with reptoboost (Fig.1)(1 scoop per 500ml water) for at least 30 minutes. If longer, change the water every 30 minutes to keep it warm.
If the animal is very weak>>> don't drown it! ENSURE NOSTRILS ARE ABOVE WATER LEVEL ALWAYS!

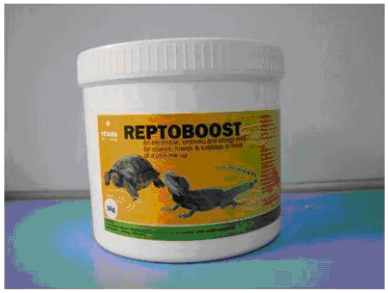


Figure 1

... or... ON VET ADVISE> Always 1% body weight SUBCUTANEOUS (Fig. 2) intracoelomic (Fig. 3) twice a day- ½ water per injection +
½ Hartmanns' solution (or Lactated Ringer) (Fig.4).
In case of extreme dehydration 2% twice a day can be given

Weight (grams) x 1 (or 2) ÷ 100 = ml of fluids total
E.g.: 30g terrapin → 30 x 1 (or 2) ÷ 100 = 0.3ml of fluids (0.15ml water per inj. + 0.15ml Hartmanns' sol.)


Figure 2

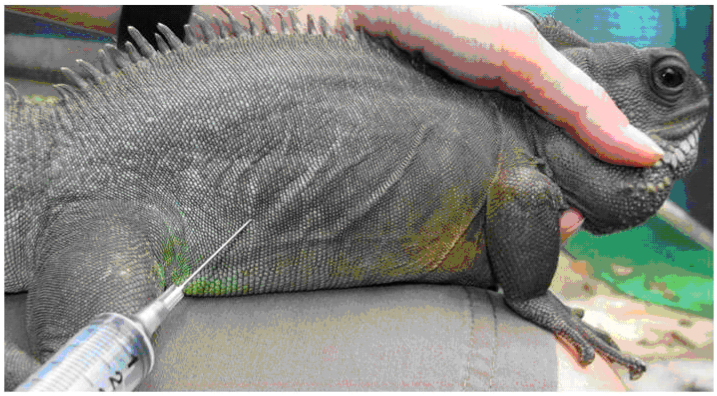


Figure 3

Figure 4

MAMMALS

BATS

LACTATED RINGERS SOLUTION

All injections are given subcutaneously. See Injection Technique on page 188.

Weight (g)	Dose (ml)	Frequency (hours)
Pups:		
less than 1.0	0.10	every 6 to 8
1.0 to 5.0	0.25	every 6 to 8
Juveniles or Adults:		
3.0 to 10.0	0.25	every 8
10.0 to 20.0	0.50	every 12
20.0 to 35.0	0.75	every 12
35.0 to 65.0	1.00	every 12

WILD BOAR, PORCUPINES and mammals in general
Hartmanns' (or Lactate Ringer) solution: 6.5% of body weight, subcutaneous, once a day

Weight (grams) x 6.5 ÷ 100 = ml of fluids total
2Kg = 2000g x 6.5 ÷ 100 = 130ml of fluids TWICE A DAY

Hydration Fluid Dosage Chart

Hydration Fluid Dosages Chart

	BIRDS		MAM-MALS Other than bats	REPTILES	
	DAY 1 (TWICE A DAY)	DAY 2-3 (TWICE A DAY)	ONCE A DAY	TWICE A DAY	
	Hartmanns 5%	Hartmanns 3.7%	Hartmanns 6.5%+8% dehydration	1% Hartmanns	1%water per injection
WEIGHT in grams				Add the 2 figures below	
10	0.5	0.37	1.45	0.5	0.5
15	0.75	0.555	2.175	0.15	0.15
20	1	0.74	2.9	0.2	0.2
25	1.25	0.925	3.625	0.25	0.25
30	1.5	1.11	4.35	0.3	0.3
35	1.75	1.295	5.075	0.35	0.35
40	2	1.48	5.8	0.4	0.4
45	2.25	1.665	6.525	0.45	0.45
50	2.5	1.85	7.25	0.5	0.5
60	3	2.22	8.7	0.6	0.6
70	3.5	2.59	10.15	0.7	0.7
80	4	2.96	11.6	0.8	0.8
90	4.5	3.33	13.05	0.9	0.9
100	5	3.7	14.5	1	1
110	5.5	4.07	15.95	1.1	1.1
120	6	4.44	17.4	1.2	1.2
130	6.5	4.81	18.85	1.3	1.3
140	7	5.18	20.3	1.4	1.4
150	7.5	5.55	21.75	1.5	1.5
160	8	5.92	23.2	1.6	1.6
170	8.5	6.29	24.65	1.7	1.7
180	9	6.66	26.1	1.8	1.8
190	9.5	7.03	27.55	1.9	1.9
200	10	7.4	29	2	2
250	12.5	9.25	36.25	2.5	2.5
300	15	11.1	43.5	3	3
350	17.5	12.95	50.75	3.5	3.5
400	20	14.8	58	4	4
450	22.5	16.65	65.25	4.5	4.5
500	25	18.5	72.5	5	5
550	27.5	20.35	79.75	5.5	5.5
600	30	22.2	87	6	6
650	32.5	24.05	94.25	6.5	6.5
700	35	25.9	101.5	7	7
750	37.5	27.75	108.75	7.5	7.5
800	40	29.6	116	8	8

	BIRDS		MAMMALS Other than bats	REPTILES	
	DAY 1 (TWICE A DAY)	DAY 2-3 (TWICE A DAY)	ONCE A DAY	TWICE A DAY	
	Hartmanns 5%	Hartmanns 3.7%	Hartmanns 6.5%+8% dehydration	1% Hartmanns	1%water per injection
WEIGHT in grams				Add the 2 figures below	
850	42.5	31.45	123.25	8.5	8.5
900	45	33.3	130.5	9	9
950	47.5	35.15	137.75	9.5	9.5
1000	50	37	145	10	10
1050	52.5	38.85	152.25	10.5	10.5
1100	55	40.7	159.5	11	11
1150	57.5	42.55	166.75	11.5	11.5
1200	60	44.4	174	12	12
1250	62.5	46.25	181.25	12.5	12.5
1300	65	48.1	188.5	13	13
1350	67.5	49.95	195.75	13.5	13.5
1400	70	51.8	203	14	14
1450	72.5	53.65	210.25	14.5	14.5
1500	75	55.5	217.5	15	15
1550	77.5	57.35	224.75	15.5	15.5
1600	80	59.2	232	16	16
1650	82.5	61.05	239.25	16.5	16.5
1700	85	62.9	246.5	17	17
1750	87.5	64.75	253.75	17.5	17.5
1800	90	66.6	261	18	18
1850	92.5	68.45	268.25	18.5	18.5
1900	95	70.3	275.5	19	19
1950	97.5	72.15	282.75	19.5	19.5
2000	100	74	290	20	20
2200			319		
2400			348		
2600			377		
2800			406		
3000			435		
3200			464		
3400			493		
3600			522		
3800			551		
4000			580		
4200			609		
4400			638		
4600			667		
4800			696		

	BIRDS		MAMMALS Other than bats	REPTILES	
	DAY 1 (TWICE A DAY)	DAY 2-3 (TWICE A DAY)	ONCE A DAY	TWICE A DAY	
	Hartmanns 5%	Hartmanns 3.7%	Hartmanns 6.5%+8% dehydration	1% Hartmanns	1%water per injection
WEIGHT in grams				Add the 2 figures below	
5000			725		
5200			754		
5400			783		
5600			812		
5800			841		
6000			870		
7000			1015		
8000			1160		
9000			1305		
10000			1450		
11000			1595		
12000			1740		
13000			1885		
14000			2030		
15000			2175		
16000			2320		
17000			2465		
18000			2610		
19000			2755		
20000			2900		

When Hartmanns' solution is not available Lactate Ringer solution should be used instead

Drug Guidelines

Drug Guidelines

Always attempt to consult the vet or the vet substitute before using the following drugs.
IF no vet advice is available the following drugs may be administered in severe cases.

AVIAN

1. ***METACAM*** oral suspension (fridge) (trade name Metacam, Meloxicam)
   For FRACTURES and neuro SIGNS
   0.13 ml/Kg ORALLY TWICE A DAY
2. ***BAYTRIL 10%*** oral suspension (fridge) (trade name Bayrtil)
   OPEN WOUNDS ONLY
   0.15 ml/Kg ORALLY TWICE A DAY

REPTILIAN

1. ***METACAM*** injectable (fridge) (Metacam, Meloxicam)
   For FRACTURES and neuro SIGNS
   0.02 ml/Kg INTRAMUSCULAR q48hrs
2. ***BAYTRIL* 50** injectable (fridge) (trade name Bayrtil)
   OPEN WOUNDS ONLY
   0.3 ml/Kg deep INTRAMUSCULAR q72hrs

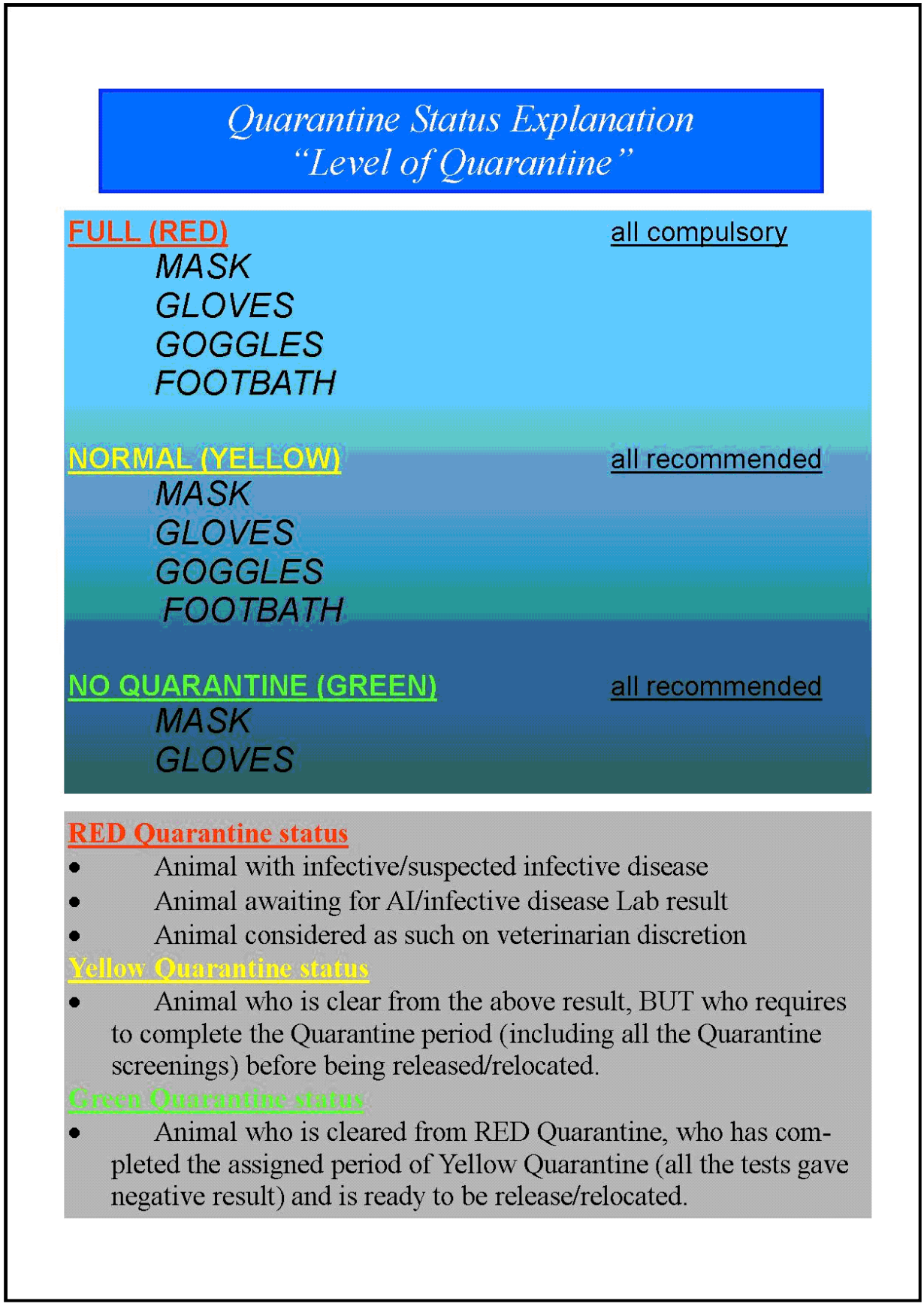
(make sure the animal is very well rehydrated!)

MAMMALIAN

1. ***RYMADIL 50*** injectable (fridge) (trade name Rymadil)
   For FRACTURES and neuro SIGNS
   0.04 ml/Kg SUBCUTANEOUS q24hrs

2. ***BAYTRIL* 50** injectable (fridge) (trade name Bayrtil)
   OPEN WOUNDS ONLY
   0.1 ml/Kg INTRAMUSCULAR deep q72hrs or SUBCUTANEOUS diluted with saline 1:1

Quarantine Levels



CHAPTER SEVEN

BEHAVIOURAL AND ENVIRONMENTAL ENRICHMENT

Environmental Enrichment and Wildlife Rescue

“Environmental enrichment is a concept which describes how the environments of captive animals can be changed for the benefit of the inhabitants. Behavioural opportunities that may arise or increase as a result of EE can be appropriately described as behavioural enrichment.” (Shepherdson, 1994)

Although environmental enrichment may not seem to be an appropriate consideration during rescue and rehabilitation work, it is often essential when an animal is confined to captivity for a prolonged period of time. For example when a primate is held in captivity for six months or more prior to re-homing. Ideally rescue centres should not be holding animals for long periods but in reality this happens. Often while supporting the local Authorities the centre may be requested to hold internationally protected animals while prosecution actions are pursued for cases which involve illegal trafficking of animals.

Simply put, environmental enrichment is a process for improving or enhancing captive wildlife environments and care within the context of their behavioural and natural history by providing animals with the opportunity to express highly motivated behaviour patterns and problem-solve.

The habitat where an animal lives is made up of a rich mix of diverse stimuli. The organism must respond appropriately in order to survive and reproduce. Being in captivity, away from all that stimuli can drastically alter animal behaviour, thus increasing the need for us to provide the necessary enrichment.

1. Allows animals control over their lives
2. Allows animals more choice
3. Allows animals to perform natural behaviours, particularly "appetitive" (goal seeking, i.e. food foraging) behaviours
4. Eliminates frustration
5. Makes captive environments more interesting to the occupants
6. Allows animals to be more active and develop appropriate musculature and cardiovascular health
7. Allows for a full range of social interactions

Proactive versus Reactive Solutions

Captive animals of different species may show abnormal behaviours that are uncommon or even absent in natural populations. Some of the behaviours arise from being exposed to stressful situations, others may arise due to boredom. Animals need to have both their physiological and psychological needs met. Once you understand the needs of the animal, based on their natural history & behaviour, you can design an enrichment program that is appropriate for them, reducing the possibility of unwanted, abnormal behaviour. A **proactive approach** is about actively enriching the habitat of an animal to prevent or decrease the onset of behavioural problems.
A **reactive approach** on the other hand, refers to cases where the animal/s have already developed abnormal, stereotypic behaviour. This can sometimes be tricky because there is a fine line between trying to distract the animal from exhibiting those behaviours, and rewarding the animal for displaying that behaviour.

How Does Environmental Enrichment Improve Well-Being?

- It increases behavioural diversity
- It increases the range of natural species-specific behaviour
- It increases an overall use of the captive environment
- It increases the ability of an animal to cope with potential challenges i.e. stress
- It decreases the occurrence of abnormal behaviour i.e. stereotypic behaviour, aggression, self-injurious behaviour

Categories of Enrichment

Naturalistic Approach

Create the complexity of a wild environment in captivity to provide stimulation for the animals

Behavioural Engineering Approach

Provide devices and machines that stimulate natural behaviour

Feeding

Presentation

The method to which food is delivered to the animals

Textures

Pureed, whole

Size

Chopped, shredded, big, small

Consistency

Frozen, jelly, solid

Colour

Animal safe dyes

Variety

Different items that are part of their regular captive diet. Can be offered daily or as part of a diet rotation (weekly, daily, seasonal)

Novelty

Items that are not usually a part of their regular captive diet

Foraging

A method used to provide opportunities for animals to actively seek out food, increase grazing or browsing time etc. It can encourage greater use of habitat space.

Placement

Out in the open, hidden, strung up, scattered around etc.

Food dispensers

Food/ Insect dispensers, prey models, mesh-nets for browsers, puzzle feeders etc

Time budget allocation

In the wild, searching for food is one of the most frequently found species-typical and time-consuming behaviours. Increasing the frequency of feeding to alter the animals' time budget, to mimic feeding behaviour in the wild

Occupational

Problem Solving

Providing animals with opportunities to problem solve with the use of devices and puzzle feeders

Toys

Objects without food with the sole intention of manipulation: fire hose balls, kegs, barrels, cardboard, piñatas, wheels, rubber toys, punching bags, feathers, clothing, balls (golf,

tennis, boomer, jungle and planet), rocks, wood, sea shells, pine cones, plastic or paper objects such as boxes, paper towels, containers, etc. These devices stimulate curiosity and may increase play and hunting behaviours

Sensory

Tactile (Touch)

Exposure to various types of material and textures, touching and feeling inanimate objects such as scratching posts, scrub brushes, snake skins, etc., or changing the consistency of items (snow, bubbles, ice, etc.)

Olfactory (Smell)

Different fragrances i.e. herbs, spices, perfume, animal scents, food extracts etc can be used around the habitat to encourage exploratory behaviour

Visual (Sight)

May involve the use of colour dyes, murals, cool-spectrum (green) lights, mirrors, motion (TV, video, DVD, video games), sun catchers, disco balls, etc. Elevated platforms, perches to allow visual access to other animal habitats

Auditory (Sound)

Vocalization from other animals i.e. predator or prey calls, mating calls, sounds from the natural environment, music and nature sounds, etc

Temperature

Used mainly for reptiles (thermoregulation)

Physical

Exhibit modification

In order to accommodate species-appropriate behaviour, the habitat must have adequate space for resting, locomotion (terrestrial and/or arboreal as appropriate), and sanitation. The most basic component of the physical or inanimate environment is the enclosure structure (its size, shape, and design) and the substrate within it.

Landscaping, Furniture & Substrate

Pools, sprinklers, wallows. Logs, branches, rockwork. Nest-boxes. Leaf litter, soil, mulch, pebbles, sand etc. Stationary and non-stationary climbing structures to add some unpredictability and encourage muscle use. Modifying these regularly can stimulate natural behaviours

Space

Utilising three dimensional area to increase/ maximise limited habitat space.

Visual barriers

Allow subordinate or timid animals to retreat from dominant animals, public eye or stressful situations. Distressed animals typically exhibit abnormal behaviours. Visual barriers can be thick vegetation, well-placed structures, netting etc

Operant Conditioning - primarily for orphaned animals that are to remain in captivity for educational purposes. Operant Conditioning is contra-indicated for animals destined to be release into the wild

Incorporate behavioural conditioning techniques to facilitate husbandry and veterinary procedures, and reduce unnecessary animal stress associated with these procedures

Reinforcement

A consequence that strengthens a behaviour and increases the likelihood that the behaviour will occur again.

Positive Reinforcement

This method is most widely used by animal keepers because it achieves the best result. Positive reinforcement training utilises giving the animal something that it desires to reinforce the subsequent response. Working with the animal regularly increases the frequency of the correct response to the cue given.

Reinforcers include – Favourite foods, verbal praise, playtime, physical interactions with the animal (i.e. petting, stroking, scratching etc). Anything that the animal sees as desirable.

E.g. Animal has been trained to touch a target. Target is presented, the verbal cue is given by the trainer "Target". Animal touches the target. Animal gets a reward.

Uses

- For husbandry purposes - i.e. shifting from den to den, daily visual checks, crating etc
- For veterinary purposes – i.e. injections, blood draw, medicating etc
- For behavioural purposes – i.e. reducing aggression (cooperative feeding method)

Some other considerations

Sufficient enrichment items should be provided to prevent unhealthy and potentially aggressive competition. If possible, each animal in the habitat should have access to at least one enrichment device.

Only items that are appropriate for that particular species should be provided. Giving an animal a device that it will not use, or cannot use is pointless. Some animals are more sensitive to certain material (i.e. snakes that are stuck to tape cannot usually free themselves without loosing scales) Destructible items should be free of staples, tape, string and other potentially harmful material Would the enrichment cause abnormally high levels of stress to the animal?

Make sure that scents used for enrichment are not too overwhelming for the animal. When using sound enrichment, make sure animals are provided with an option for escape or means to mobilize for confrontation – reduces stress. Can the item be removed from the animal in a safe manner in case of an emergency?

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Zoo & Wild Animal Medicine 4th Edition. Murray E Fowler and R Eric Miller (1999), W.B. Saunders Co.
Zoo & Wild Animal Medicine 5th Edition. Murray E Fowler and R Eric Miller (2003), W.B. Saunders Co.

Useful Website Addresses:

International Organisations:
The Convention on International Trade in Endangered Species of Wild Fauna and Flora: http://www.cites.org
IUCN Species Survival Commission Red List of Threatened Species: http://www.iucnredlist.org/
Institute of Zoology Chinese Academy of Sciences中国科学院动物研究所：
http://www.ioz.ac.cn/index.asp

General Wildlife Rehabilitation:
International Wildlife Rehabilitation Council: http://www.IWRC-online.org
Network Wildlife Rehabilitation and Research: http://groups.yahoo.com/group/NWRR/
The Wildlife Rehabilitation Information Directory: http://www.tc.umn.edu/%7Edevo0028/index.htm#mm
Wildlife Information Network organisation (Wildpro):
http://wildlife1.wildlifeinformation.org/Wildpro_Online.asp
British Wildlife Rehabilitation Council http://www.bwrc.org.uk and
http://www.bwrc.org.uk/Library/Other%20publications/GUIDELINES.doc
Wildlife International http://www.wildlifeinternational.org/EN/rehab/care/care.html

Mammal Links:
Species Survival Commission Mammal Specialist Groups:
http://cms.iucn.org/about/work/programmes/species/working_together/specialist_groups/directory_specialist_groups/directory_sg_mammals/index.cfm

Reptile Links
Turtle Survival Alliance: http://www.turtlesurvival.org
Chelonian Research Foundation: http://www.chelonian.org
World Chelonian Trust: http://www.chelonia.org/
Tortoise Trust: http://www.tortoisetrust.org
Hong Kong Society of Herpetology Foundation 香港兩棲及爬行動物保育基金,香港兩棲及爬蟲協會:
http://www.hkherp.org/

Bird Links:
Hong Kong Bird Watching Society: http://www.hkbws.org.hk/
China Bird Net (HKBWS): http://www.chinabirdnet.org/BBS/index.php
Beijing Raptor Rescue Centre: http://www.brrc.org.cn
The Science of Birds: http://www.Ornithology.com

Books, Equipment & Online Courses Links:
Books: http://www.nhbs.com/
UV guide for Reptiles: http://www.uvguide.co.uk/index.htm
Reptile & Exotic Animal Husbandry Equipment: http://lllreptile.com/
Reptile Husbandry Equipment: http://www.reptileparadise.com/main_c.htm
Exotic Animal Husbandry Equipment: http://www.arcatapet.com/
Online Wildlife & Husbandry Courses: http://www.universalclass.com/i/crn/30365.htm

Acknowledgement

Present and past members of the Fauna Conservation Department have contributed to the content of these Operational Guidelines since the Centre was established in 1994. Ideas and working methodology have been developed using established best practices and useful suggestions over the years from friends and partners.

We thank all those involved in the Rescue and Rehabilitation work and the following staff who contributed to this edition of the guidelines: Amanda Crow, Paul Crow, Alex Grioni, Debbie Ng and Tan Kit Sun

APPENDICES

Appendix 1 Animal Acceptance Protocol

The acceptance protocol was formulated following a discussion with the Agriculture, Fisheries and Conservation Department (AFCD) and the Society for the Prevention of Cruelty to Animals (Hong Kong) (SPCA) in October 1996, concerning placement of confiscated and injured wild animals in Hong Kong. The protocol clarifies what species may be accepted by the Fauna Conservation Department.

ANIMAL ACCEPTANCE PROTOCOL

The WARC will consider acceptance of animals that fall into one or more of the following categories;

1) If suspected to be a species of wild animal that is native to Hong Kong.
2) If the species is of significant conservation value. This includes:
    a) Species listed as Threatened or above in the IUCN Red List of Threatened Animals (normally those not commonly bred in the commercial trade)
    b) Species listed by CITES and not commonly bred in the pet trade
    c) Species that have been shown to be under threat by current research or trends but that have not been formally listed yet

- The Wild Animal Rescue Centre (WARC) has the right to turn away any animals. Life-time cost of animals being presented for rescue and rehabilitation will be an acceptance consideration and this aspect of operation will be monitored by the Head of Department.
- A non-native wild animal that is CITES listed, requires permission from the AFCD before it is accepted by KFBG
- Any animals that do not fall into these categories will not be accepted by KFBG unless special authorisation is given by the Head of Department.

Procedures for Accepting Animals
An acceptance form must be filled in detailing the name of the person/organisation handing over the animal.

Rights over accepted Animals

Once an animal is accepted by KFBG then KFBG assumes ‘ownership’ and acquires all rights to make decisions about the future of that animal within the framework of the law. This does not apply to animals being held in temporary housing on behalf of the AFCD.
Non-acceptance of Animals
Animals turned away should be referred to the SPCA if they are common pet species or domestic species that are suitable for the SPCA re-homing programme. All other animals should be referred to the AFCD.

Appendix 2 Animal Holding and Placement

ANIMAL HOLDING AND PLACEMENT

All animals held at KFBG by the Fauna Conservation Department, whether newly admitted or long-term residents, must fulfill the following criteria;

The animal must enjoy, or have potential to enjoy, an acceptable quality of life, for the rest of its natural life, in one of the following locations;

a) In the wild
b) In a KFBG educational display
c) In a local accredited* conservation/education programme
d) In an overseas accredited conservation/education programme

Any animal that does not fulfill these criteria must be considered for suitable placement or euthanasia.

* Accredited institutes include those recognized by IUCN or the world zoos associations

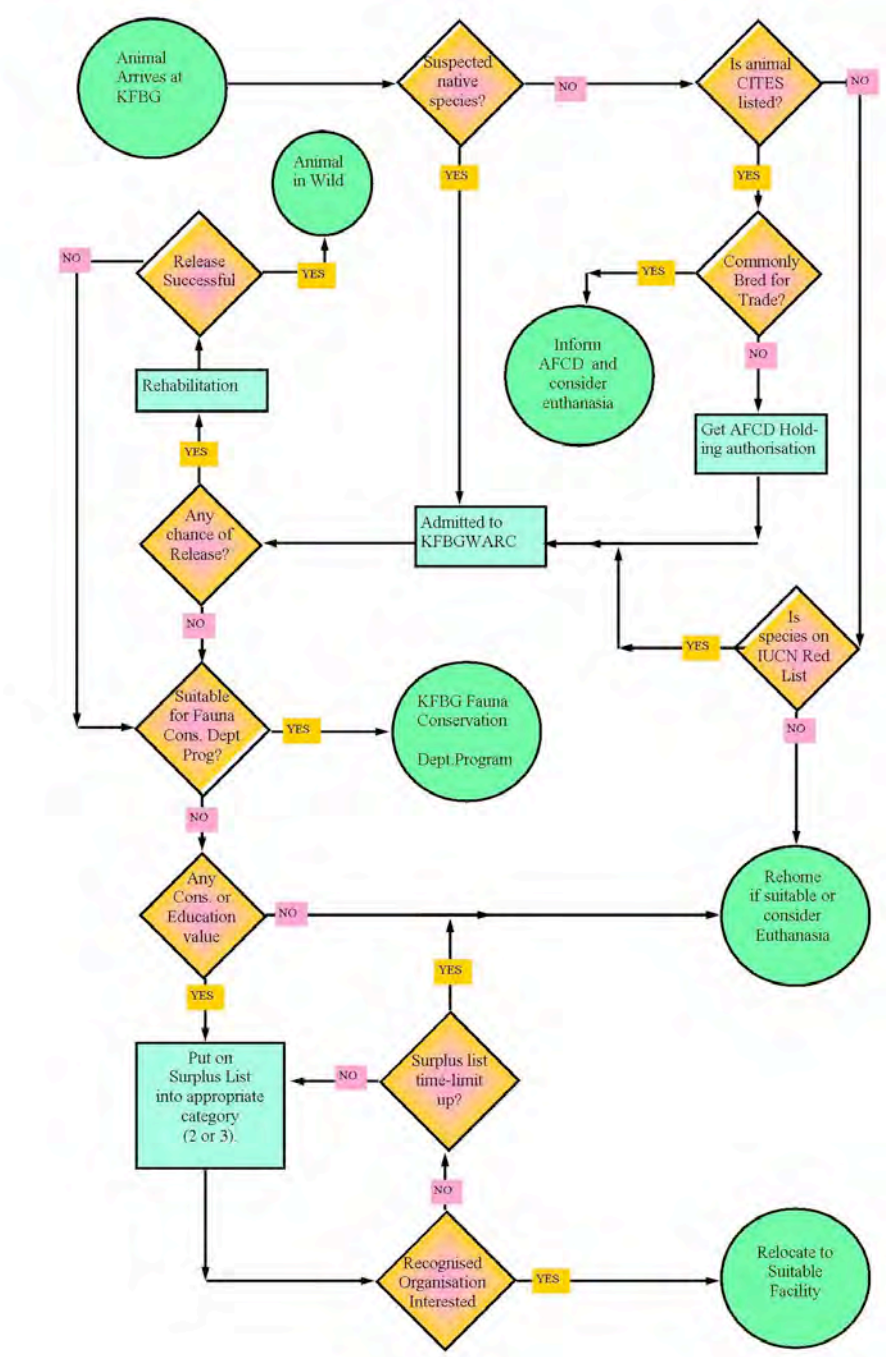
The definition of an acceptable quality of life

An acceptable quality of life in captivity should include all of the following:-

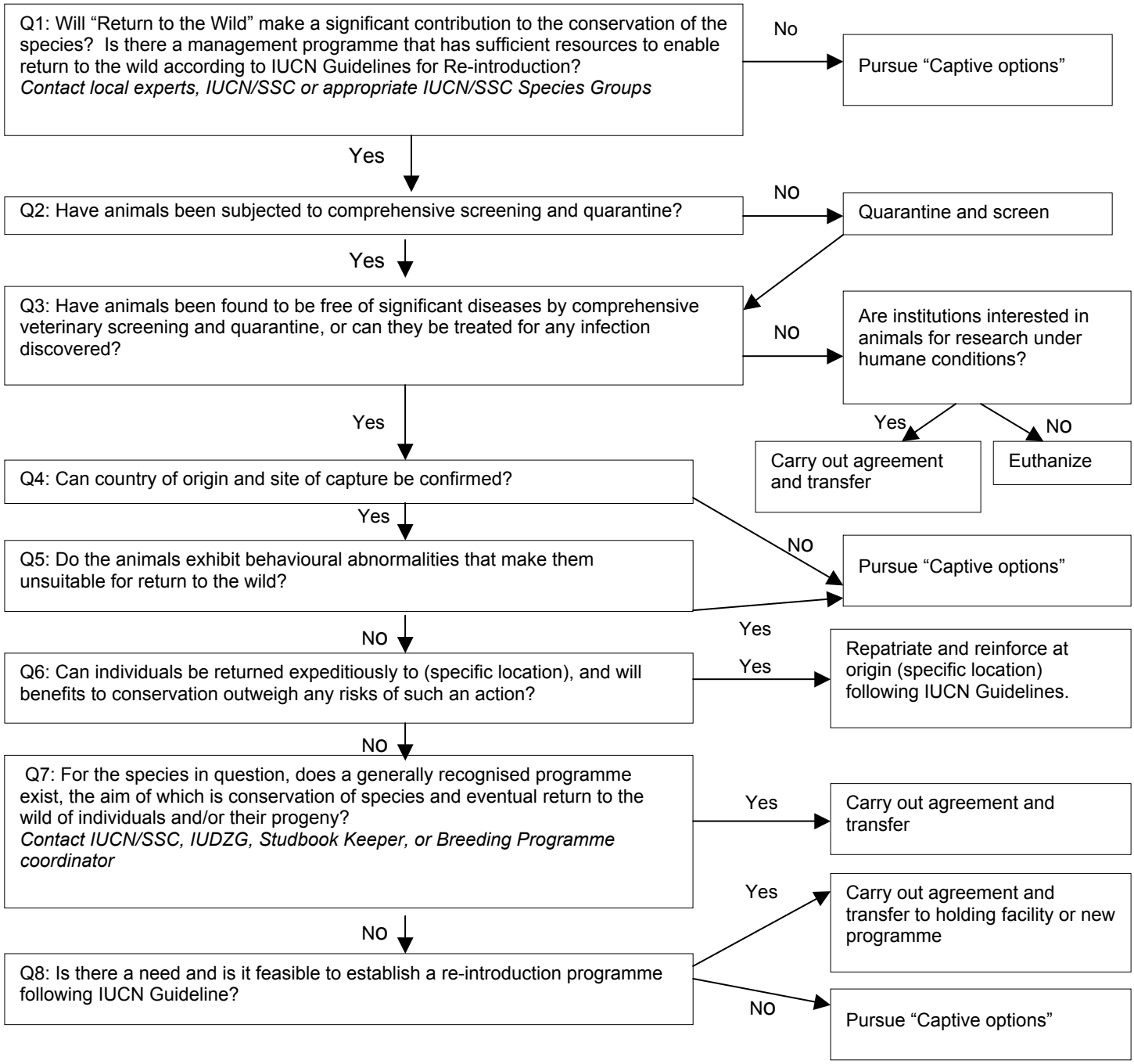
1. Enough space to allow the animal to move around to significantly different parts of the enclosure.
2. The animal must have the physical ability to move about the enclosure with relative ease and be able to do so in a manner that approximates normal behaviour for the species, without risk of serious falls or repeated injuries.
3. The animal must be able to cope with the conditions of confinement both mentally and physically (i.e. it should not be stressed by its confinement)
4. The animal should have enough personal space from other animals and people.
5. The correct temperature range and adequate shelter should be available.
6. Ample and nutritionally complete diet.
7. A right to and provision of at least a basic level of enrichment - adequate to prevent recognized symptoms of its deficiency.

An acceptable quality of life should result in healthy, well-nourished animals that show content behaviour close to normal for the species and have no chronic injuries or wounds that would be incompatible with quality of life.

Appendix 3 WARC Animal Acceptance, Holding and Placement Flowchart



Appendix 4 Decision Tree For Return To The Wild (IUCN Guidelines, 2000)



***NB:** Following this tree may not be necessary if the animal is native, known to have originated locally and injuries are minor enough for near immediate release to be considered.

Appendix 5 Euthanasia Protocol

Any non-releasable wild animal that would not enjoy an acceptable quality of life in captivity should be euthanized.

Any non-releasable wild animal that is of no or minimal conservation or educational value should be euthanized, unless it can enter a local accredited Education Programme and is deemed of safe temperament.

Before any euthanasia is carried out, the Head of Department, Fauna Conservation Department must be notified for final approval. Exception may include those animals that require immediate euthanasia because of pain and suffering, in these cases the Veterinary Officer will be responsible for the immediate decision.

Some examples of cases that we have encountered that are candidates for euthanasia are given below:-

A bird admitted with a severe long-bone fracture of which amputation is the only likely treatment, resulting in a bird that cannot be released and cannot get about its enclosure properly.

A snake admitted with its fangs pulled out which would not be able to feed properly.

A poisonous, non-releasable snake that is of insufficient educational or conservation value to justify the cost of safety requirements.

A nest of common young birds such as magpies that are likely to become imprinted if hand-raised, is of insufficient conservation or educational value to justify the cost of labour required to raise them.

A common pet trade animal of no conservation value or educational value such as an unfriendly green iguana for which space is unavailable (If CITES listed and on Government holding, the authorities should be notified first).

Appendix 6 Safety Protocol (Working In Animal Enclosures)

The guidelines below should be followed when entering any animal enclosure and are suggested as the minimum measures taken to provide safety;

Allocation Of Safety Equipment

Safety Equipment should be provided at suitable locations near all animal enclosures. The following are the minimal provisions:-

- Helmet
- Goggles
- Gloves
- Face mask

Use Of Safety Equipment

Staff members are advised to use the appropriate safety equipment when working in cages.
Examples of jobs requiring safety equipment:
Branching cages – helmet, gloves.
Working with herons – goggles.
Working with quarantined animals – protective face mask.

Dangerous Animals

Staff will not be permitted entry into enclosures housing dangerous animals. Such cages will be marked with a clear sign and locked. Entry into such cages will only be given under the supervision of the officer in charge or under special instructions from the officer in charge. In such cases special measures will be undertaken to prevent injury from the animal.

* KFBG's Dangerous Animal Escape Protocol can be found on the KFBG website: www.kfbg.org

Appendix 7 Release Guidelines

Before any animal that has been admitted to the Wild Animal Rescue Centre (WARC) is considered for release, the following criteria should be fulfilled.

Condition

The animal must have the physical ability to perform the natural feeding techniques that the species uses.
The animal must have the physical ability to protect and defend itself in a normal manner.
The animal must have the mental ability to perform points 1 and 2 above.
The animal must have the fitness required to perform points 1 and 2 above.

Release Site and Time

The animal must be native to the area where it is to be released. Efforts should be taken to ensure that animals are genetically compatible with those residents in the area. Exceptions may include birds and bats which disperse by flight.
The release site must be the correct habitat for the animal.
The release must take place at the time of year that the species normally occurs in the area.
The release must not adversely effect existing populations.

Note: Advice from experts familiar with the species and its habitat needs, should be sought wherever appropriate.

Approval

All releases should be assessed on a case-by-case basis. Before any release takes place, it is important that the WARC team discuss the case.

Post-Release Identification Devices And Monitoring

Whenever possible, post release monitoring should be undertaken. This includes marking the individual released (with a ring tag or microchip) as well as field observations or the use of tracking equipment.

Appendix 8 Snake Acceptance Procedures

Background

The Fauna Conservation Department runs a joint rescue project for native snake species in collaboration with the Hong Kong SAR Police Force and with the knowledge and sanction of the Agriculture, Fisheries and Conservation Department (AFCD) of HKSAR Government. Under this project, police are instructed that they can deliver stray snakes on a 24-hour drop off basis, 7 days a week. Snakes if native and healthy are relocated to the wild at a safe distance from human habitation and snakes of unknown origin or seriously injured are euthanized.

(A) Snake Acceptance During Office Hours (Fauna Staff In Attendance)

When police arrive on the premises with a snake, reception staff should immediately contact a Fauna Conservation Officer (CO). Reception staff may refuse to take any snakes that arrive in containers not of the recommended design if conservation staff are not available. Snakes should be in a canvas sack within a wooden box.

After informing a CO (and unless otherwise instructed), the police should be directed to the Wild Animal Rescue Centre (WARC).

At the WARC, a CO will take charge of the boxed snake.

NB: NO CONTACT SHOULD BE MADE WITH THE SNAKE AT THIS TIME (Only the designated staff can open snake boxes and bags to identify species).

The police should be requested to complete a snake acceptance form (see attached) and both the form and “a box occupied” label should be attached to the holding box.

The Police should then be provided with replacement (spare) box and bag set.

The snake should remain undisturbed until such a time that a staff member approved by the Head of Department, Fauna Conservation, is available to check the identification of the species of snake and if necessary to handle venomous snakes.

Once identified by the approved handlers as a non-venomous species, cases may be passed to other staff with appropriate experience, for inspection or release.

Venomous species of snake remain the responsibility of approved handlers only and should be labelled as such.

Prior to release or disposal, all information on the received snake should be noted in the ‘snake rescue project manual’. Full reports are sent to the police and AFCD on a quarterly basis.

(B) Snake Acceptance Outside Office Hours (in the absence of Fauna staff)

1. When police arrive on the premises with a snake they should be received by the security guard on duty (the contact number for the security team is posted on the main gate). The first task is to ascertain if the snake is correctly bagged and boxed by asking the officers present.

NB: THE BOX SHOULD NOT BE OPENED AT ANY POINT.

NB: SNAKES INCORRECTLY BOXED SHOULD BE TURNED AWAY – IF BOXING IS IMPROVED, THEY CAN BE RETURNED LATER.

2. Correctly delivered snakes (still in the locked box) should be placed in the designated snake holding room and the police should be given a replacement box and bag set and hand over any related paperwork.
3. Before the officers depart, they should be asked to complete a snake acceptance form which should be passed to a Fauna CO at the earliest available moment. For convenience gate keeping staff may be asked to pass the completed form to arriving Conservation Officers (CO) the morning after delivery.

Appendix 9 – Snake Delivery Record Form

SNAKE DELIVERY RECORD TO BE COMPLETED BY DELIVERING OFFICER. 送蛇記錄(由送蛇人員填寫)

NO.OF SNAKES蛇的數目 ……

TYPE IF KNOWN蛇的品種 ……..

COLLECTION ADDRESS (Town/village)拾獲地址

……

COLLECTION SITE NATURE 拾獲地點的用途
(Industrial/residential/rural etc.) (如住宅、工業等)

……

POLICE DISTRICT警區

……

DELIVERY DATE/TIME / OFFICER NAME
送到農場日期/時間 / 送蛇人員姓名

……
Delivered in stipulated bag (☐Yes ☐No) & transport box (☐Yes ☐No).
If no you maybe asked to return in opening hours 9-5pm.
有否把蛇放在規定的袋 (☐有 ☐沒有) 及箱內 (☐有 ☐沒有)， 如沒有, 嘉道理農場職員有權在早上九時至下午五時退回該蛇。

Appendix 10 Self-Evaluation of Facilities

(Based on IWRC (International Wildlife Rehabilitation Council) Minimum Standards for Wildlife Rehabilitation 2000)

Introduction

The information and questions contained in this form are a means for rehabilitation facilities and individual rehabilitators to do a self-evaluation or self-review. The form helps to review areas including:-

- Housing
- Medical treatments and diagnostics
- Disease prevention and contamination
- Food preparation
- Disinfections
- Good housekeeping
- Not all items contained in the form will apply to every facility.

Facility Review

I. Receiving Area

Public Information

1. Are there written policies or procedures for staff and volunteers dealing with wildlife problems?
2. Does the organization have information available to the public on the services it provides for wildlife?

Procedures

1. Does the organization have operational policies available to staff members and volunteers (e.g. operations manual, rules derived from Board decisions, or training materials)?

Records

2. Is there a medical record for each animal that has a medical problem?
3. Do animals without medical problems have records (e.g. orphans)?
4. Are the records legible?
5. Are records adequately completed (i.e. can the progress of the animal be followed by reviewing the record)?
6. Is there a system to identify each animal to its record?

Facilities

1. Is the reception area neat and presentable?
2. Is it organized so that resident patients are not subject to stress during the intake of new animals?

Telephone Services -

1. For those providing help, assistance, and directions to the public, are protocols established to provide assistance in the following areas:
2. Humanely preventing or reducing wildlife problems, conflict situations, and injury?
3. Determining if animals in fact need to be rescued?
4. Providing strategies and techniques to give opportunities for mother animals to retrieve temporarily displaced young or to re-nest?

5. Suggesting safe capture, restraint and transport techniques to minimize risk of injury to animals and to humans?

II Intake/Exam Area

1. Is the area clean?
2. Is the area set up so that animals can be examined safely?
3. Are first-aid supplies available?
4. Are there scales available to weigh animals as part of intake and assessment?
5. Are animals awaiting exam/treatment provided a warm, quiet and dark place?
6. Are facilities arranged and/or constructed to minimize stress on the animals?
7. Are the sound and activity levels minimized to reduce stress on the animal?
8. Are capture and handling equipment easily accessible and in good working order?
9. Are they used safely?
10. Are capture, handling, and restraint procedures safe for animals and humans?
11. Are the people handling wildlife trained in safe handling techniques?

III Facilities For Intensive Nursing Care

1. Available at a veterinary facility
2. Available on-site
3. Are the following available for use when necessary?
4. Incubators
5. Heat sources (lamps, pads)
6. Is the area clean?
7. Is it a low-use area?

IV Surgery

1. Available at veterinary clinic/hospital
2. Available on-site
3. Is the area aseptic?
4. Is there resuscitative equipment available?
5. Is there a pre-surgical prep area?
6. Is the surgical equipment in good working order?
7. Is an anaesthetic maintained?

V Radiology Services

1. Available at veterinary clinic/hospital
2. Available on-site

VI Initial Care Facilities

1. Do the cages meet caging standards for the species handled?
2. Are they constructed so that they can be cleaned and disinfected (e.g. stainless steel, fibreglass, sealed wood, coated port-a-pets)?
3. Are the cages cleaned regularly (as appropriate for the species and cage type)?
4. Is the area adequately ventilated in an appropriate manner?
5. Is there adequate lighting (full-spectrum light at the appropriate hours)?
6. Are isolation facilities available (on-site, at a veterinary clinic, elsewhere)?
7. Is the area away from the main flow of human activity?
8. Is there access to the area by domestic pets?

VII Primary Exercise Caging

1. Do they meet caging standards for the species being handled?
2. Are they cleanable?
3. Is there a regular cleaning schedule?
4. Are they safe to the handlers and animals being held (e.g. no loose or sharp wires or nails, double doors, etc.)?
5. Are they secure (e.g. locking, sturdy, safe from predators)?

VIII Pharmacy

1. Is the area clean and organized?
2. Are needed medications on hand? Are other medications available by prescription or through sponsoring organizations?
3. Are controlled drugs (schedules II, III, IV) kept in locked, secure location?
4. Is there a log for controlled drugs?
5. Are antibiotics, parasiticides, vaccines, etc., available either in the pharmacy or on a prescription basis?
6. Are emergency medications available?

IX Disinfecting

1. Is there a standard procedure and schedule for cleaning and disinfecting cages, feeding utensils, syringes, food storage containers, and food, water, and bathing bowls?
2. Are cleaning and disinfecting supplies available and stored properly?
3. Is human protective gear (gloves, masks, goggles) available?
4. Are instructions on the proper use of disinfectants displayed?
5. Is there a designated area for storage, cleaning and disinfecting of dirty items?
6. Is there a designated area for storage of clean and disinfected items?

X Pathology Services

1. Available on-site
2. Available through veterinarian
3. Commercial account
4. Can the following services be provided to wildlife when necessary?
5. Haematology (PCV, Diff., Hb, WBC, Clot Time, ESR, Serum Chemistries?
6. Parasitology?
7. Microbiology?
8. Necropsy Services?
9. If done in shelter:
10. Are separate instruments used for tissue gathering and necropsy?
11. Are dead animals disposed of in accordance with applicable ordinances or regulations?

XI Food Preparation & Storage

1. Is the area clean, orderly?
2. Are adequate foodstuffs and supplies available?
3. Are foodstuffs (chicks, rats, fish) stored separately from dead (rehabilitation) animals?
4. Are perishable foodstuffs dated (open formula)?

XII Housekeeping & Maintenance

1. Is there a reasonable schedule for:
2. Daily cleaning?
3. Weekly cleaning?
4. Seasonal cleaning?
5. Is there a continuing program for repair and upkeep of the facility?

XIII Library

1. Is there a continuing program for acquisition of pertinent publications on wildlife rehabilitation?
2. Are manuals/books available on providing humane solutions to human/wildlife conflicts?
3. Are publications available that describe each species and its natural history?

XIV Safety

1. Is there a fire alarm?
2. Is there a fire extinguisher(s)? Are eating, drinking, smoking, etc., restricted to designated areas?
3. Is there a first-aid kit available for staff/volunteers?
4. Are material data safety sheets (MSDSs) readily available/easily accessible for those chemicals used at the facility (disinfectants, cleansers, certain drugs, etc.)?

XV Organizational Standards

1. Does the individual or organization comply with local ordinances and have current state/provincial/federal permits for the work being done?
2. Is there a grievance policy for staff/volunteers?
3. Is there a training policy for staff/volunteers?
4. Are there continuing training opportunities for staff (paid and volunteer) who have completed basic skills training (staff training sessions, IWRC and NWRA programs, etc.)?
5. Is there a liability insurance policy for volunteers to protect the facility and/or organization?
6. Is there a workers compensation policy for employees?
7. What after-hours services are available for emergency cases (on-call person, emergency veterinary clinic service, etc.)?
8. Are there written policies to instruct the volunteers regarding rules of the organization as they relate to animal care, reporting procedures, rules on conduct?

XVI Continuing Education

1. Is pertinent information collected on wildlife rehabilitation?
2. Does the permittee's organization collect such information and share it with other members?
3. Does the permittee and/or others in the organization attend continuing education classes or conferences on wildlife rehabilitation?

Appendix 11 – Acceptance & Transfer Form

Kadoorie Farm Acceptance / Transfer Form

Acceptance **Transfer** **(Circle as appropriate)**

Invertebrate	Fish	Amphibian	Reptile	Bird	Mammal

Species			
Numbers			
Date of transfer			
Time of transfer			
Transfer to	**Transfer From: PUBLIC/AFCD/ SPCA/ KFBG/Other**		
Location / Office of transfer			
Case Number (if any)			
ESP Number (if any)			
ARKS Number (if any)			
ID Number (if any)			
Received by		**Contact**	
Signature		**HKID**	
Delivered by		**Contact**	
Signature		**HKID**	

Appendix 12 – Case History Form

CASE HISTORY

1) When Was this animal collected .....

2) Where has this animal come from ? (Please circle)

Wild Area - Urban Built Area - Urban Park - Market Place - Illegal import/export - Illegal trade - Pet trade

Other (please describe) .....

.....

3) Why has the animal been brought in? (Please circle)

Injury - Sickness - Weakness - Contaminated - Trapped - Abandoned by Parent

Unable to Fly/Walk/Move - Confiscated - Stray - Surrendered Dumped by Owner -

OTHER .....

4) Any possible cause of injury/ sickness? Please describe .....

.....

5) Has animal been given any food or water? Please describe .....

.....

6) Has animal been given any medical attention? Please describe .....

7) Have any observations made during its time in captivity that may assist in its future care?

(Please describe) .....

8) Has this animal been in close contact with any other animals or their Food/Water/Waste in your care or transport? (Please circle)

YES - What type(s) of animal (s) and from what source? (Please describe)

NO DO NOT KNOW (Can enquire @ later date)

9) Has this animal caused any human injury? No Yes Details……..

OTHER NOTES:

Appendix 13 – Mammal Admission Form

Arrival Date	Common Name

MAMMALIAN ADMISSION FORM

Scientific Name	SEX

SOURCE&ORIGIN					**STATUS**				
IDENTIFICATION					**QUARANTINE.REQ.**				
WEIGHT	**AGE**	Pre-weaned	Juv.	Adult	**MUSCLE CONDITION**	Normal	Slight wasting	Thin	Critical
HYDRATION STATE		Normal	90-100%	<90%	**POSTURE**	Normal	Unstable	Lying	Other

EYES		Clear Normal	Dilated Un-responsive	Closed	Discharge / Blood
	LEFT				
	RIGHT				
NOSE & MOUTH	Normal / Clear	Dis-charge	Blood	Gasp-ing	Other

HANDLER:

FOLLOW-UP ACTION:

ACTION TAKEN:

HYDRATION	Fluid given	Route	Amount
FEED	Food offered	Presentation	Amount
INITIAL HOUSING			
NOTES:			
DIET:			
HUSBANDRY:			

PLEASE INDICATE INJURIES.

Appendix 14 – Avian Admission Form

Arrival date	Common Name

AVIAN ADMISSION FORM

Scientific Name	SEX

SOURCE&ORIGIN					**STATUS**					
IDENTIFICATION					**QUARANTINE.REQ.**					
WEIGHT	**AGE**	Pre-fledge	Juv.	Sub-Adult	Adult	**MUSCLE Condition**	Normal	Slight wasting	Thin	Critical
HYDRATION STATE		Normal	90-100%	<90%	**POSTURE**		Normal	Unstable	Lying	Other

EYES		Clear Normal	Dilated Un-responsive	Closed	Discharge / Blood
	LEFT				
	RIGHT				
NOSE & MOUTH	Normal / Clear	Dis-charge	Blood	Gasp-ing	Other
FEET **GRIP+ CONDITION**		Strong	Weak	Nil	Lesions
	LEFT				
	RIGHT				

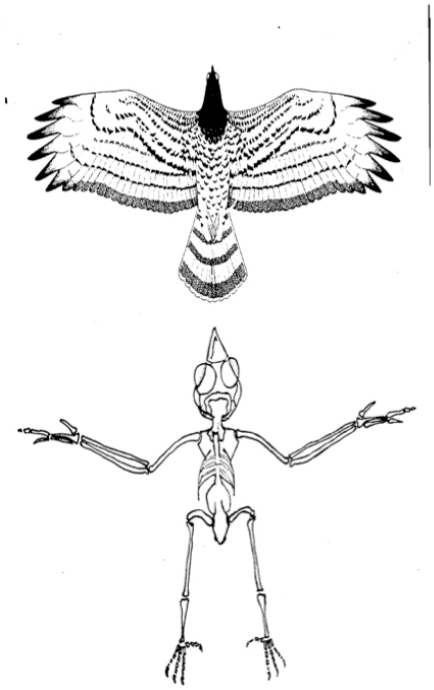
HANDLER:

FOLLOW-UP ACTION:

ACTION TAKEN:

HYDRATION	Fluid given	Route	Amount
FEED	Food offered	Presentation	Amount
INITIAL HOUSING			
NOTES:			
DIET:			
HUSBANDRY:			

PLEASE INDICATE INJURIES / DAMAGE AND FEATHER LOSS.
RIGHT……LEFT



Appendix 15 – Reptile Admission Form

Arrival date	Common Name

REPTILE ADMISSION FORM

Scientific Name	SEX

SOURCE&ORIGIN				**STATUS**				
IDENTIFICATION				**QUARANTINE.REQ.**				
WEIGHT	**AGE**	Juv.	Adult	**Muscle Condition**	Normal	Slight wasting	Thin	Critical
HYDRATION STATE		Normal	90-100%	<90%	**POSTURE**	Normal	Unstable	Other

EYES		Clear Normal	Dilated Un-responsive	Closed	Discharge / Blood
	LEFT				
	RIGHT				
NOSE & MOUTH	Normal / Clear	Dis-charge	Blood	Gasp-ing	Other
FOOT CONDITION		Front		Rear	
	LEFT				
	RIGHT				

HANDLER:

FOLLOW-UP ACTION:

ACTION TAKEN:

HYDRATION	Fluid given	Route	Amount
FEED	Food offered	Presentation	Amount
INITIAL HOUSING			
NOTES:			
DIET:			
HUSBANDRY:			

PLEASE INDICATE INJURIES OR CONCERNS NOT OTHERWISE COVERED:

Appendix 16 – Hospitalization & Treatment Record

Page _____.

Hospitalization/Treatment record for Quarantine

Animal:		**ID:**	
Arrival Problem			
Outcome			

Date	Weight	Husbandry Notes	Medical Notes

Appendix 17 - General Quarantine Principles

Introduction

The KFBG Wild Animal Rescue Centre (WARC) will endeavour to ensure that animals in quarantine and their waste will remain separated from all non-quarantine cases. Where possible, quarantine animals will be provided a dedicated facility. Due to the nature of a rescue centre and the flow of animals through it, it is recognised that total isolation may not always be possible. In such cases, husbandry and management practices will be modified to ensure that the best and most realistic quarantine barriers possible are in place.

3 COLOUR CODED LEVELS OF QUARANTINE		
LEVEL	**PROTECTION**	**REQUIREMENT**
FULL (RED)	MASK	COMPULSORY
	GLOVES	COMPULSORY
	GOGGLES	COMPULSORY
	FOOTBATH	COMPULSORY
NORMAL (YELLOW)	MASK	RECOMMENDED
	GLOVES	RECOMMENDED
	FOOTBATH	COMPULSORY
	GOGGLES	RECOMMENDED
NO QUARANTINE (GREEN)	MASK	RECOMMENDED
	GLOVES	RECOMMENDED
	FOOTBATH	RECOMMENDED

Qualifying Statements

1. All new cases are categorized as “full” quarantine (red) until such a time that the attending veterinarian states otherwise.

2. Normal Quarantine (Yellow) – denotes all other quarantine situations following initial screening by the veterinary officer

3. The green level denotes that animals have finished the required quarantine period and are ready to be **RELEASED/RELOCATED/REHOMED** (note: some local wild animals may not require a fixed quarantine period, to be decided by the veterinarian).

4. Full quarantine is not necessary during handover of an animal contained in a box (from SPCA or HK Police), but when the box is opened full quarantine should be followed. Any exceptions to this will be decided by the Veterinary Officer.

5. The Veterinary Officer will notify staff regarding the level of quarantine and is responsible to ensure that the animal records clearly indicate the quarantine status and any related Health and Safety management issues that arise as a result. The procedure should be clear to all staff working in the relevant areas.

6. The above management practices are in place to safeguard staff and animals from possible disease risk associated with working with animals.

7. The management guidelines apply to all animal cases admitted to the WARC and animals held under permanent exhibit. The guidelines set out standard practice and deviation will only be allowed on a case-by-case basis under the instruction and approval of the attending veterinarian.

8. In any animal handling, care and husbandry situation other protocols relating to health and safety or access may also apply and should be followed in addition to these management practices.

9. In all cases wash/disinfect hands before and after handling or husbandry work. Utilize the appropriate clothing and cleaning equipment and agents provided. Utilize dedicated tools when provided or instructed to do so. Take care to minimize your and other staff risk of contamination at all times. Immediately report any personal injury or practices that may put a staff member at risk.

10. It is the responsibility of the supervising officer in charge of a case to ensure all staff in contact with a case is aware of the quarantine requirements. A colour coded flagging system as shown above will indicate the risk levels. A **red card** will be placed on enclosures containing high-risk "full quarantine" cases. Enforcement responsibility lies with the case supervisor, which will normally be the veterinary officer, senior conservation officer or conservation officer. The department head is responsible for ensuring that all agreed safety equipment is available. Staff should report immediately if any safety equipment is lost or faulty in order to get immediate replacements.

Special Consideration

- All birds coming through the WARC during the Avian Influenza (AI) sensitive period (Nov-May) will be tested for AI with either cloacal or cloanal swabs, to be sent to the Government Labs.
- All dead/euthanized birds which did not have a previous negative AI result, will be sent to the Govt lab. for AI testing.
- All dead chickens will be delivered to the WARC. They will be placed outside the Vet Hospital (VH) in the designated plastic bin and await disposal –
  1. Sentinels will be sent to the Govt lab with "non-AI vaccinated" printed on the lab form.
  2. Non Sentinels will be up to veterinary discretion whether they are sent to the Govt lab. Lab Form should say "AI vaccinated".

Birds entering the WARC acceptance procedures may be asymptomatic but later test POSITIVE for Avian Influenza (Govt. Lab).
A prompt response is expected from Agriculture, Fisheries & Conservation Dpt. (AFCD), but the immediate Farm staff response on receiving notice of an AI positive bird should be:

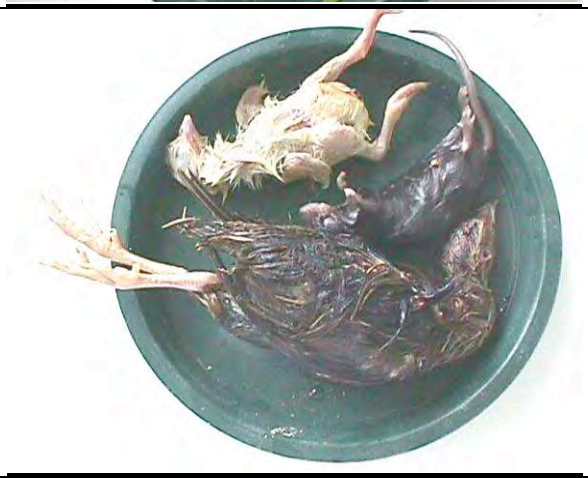
- Open a conversation channel with AFCD on receiving the result from the lab
- Make the room/ward where the bird presently is as HIGH QUARANTINE ROOM (RED)
- Raise the KFBG Bio security Measures to KFBG Serious Response Level (Red) whether or not KFBG is on Alert Response Level or No Response Level
- No staff are allowed to go in without direct permission from the Vet or Dept. Head
- No animal movements are allowed in-out of the room
- No tools/cages/instruments are allowed in-out of the room
- Isolate all animals that have been in contact (even briefly) with the affected bird with consideration for ALL infectious pathways and implement suitable barrier techniques
- High bio security measures should be put in place (masks, gloves, goggles and wet disinfectant mats) for that room
- Do a survey of all the staff that have been in contact with the affected animal and follow suggestions from AFCD/Hygiene Dpt. Which might involve isolation/testing

- Liaise with AFCD for any additional measures
- AFCD personnel will collect the subject bird.

All mammals cleared of quarantine in less than ten days may be required to be held for observation until the completion of the ten days. This is the necessary period to confirm that the mammal shows no sign of RABIES.

Appendix 18 Rough Bird Feeding Guide

1		*Corn, Peas* *Beans, Seeds* *Mixed cereals* *PLUS* *Chopped soft fruit* *穀粒, 豌豆, 豆, 種子* *剁碎之水果*	*Pigeons* ***Doves*** *鳩鴿*
2		*Mixed Seed, Millet* *Rape Seed* *Small amount fruit & insects* *種子, 黍* *葡萄渣, 小量水果* *或昆蟲*	*Finches* ***Sparrows,*** ***Canaries,*** ***Munias,*** ***Hawfinches,*** ***Buntings*** *雀,* ***麻雀,*** ***文鳥,*** ***鴽,***
3		*Commercial song bird /Chicken feed* *Plus* *Mixed soft fruit & Insects.* *普通雞料, 及水果, 或昆蟲*	*Songbirds* ***White eyes,*** ***Hwamei, Mynas,*** ***Starlings, Bulbuls,*** ***Magpie Robins.*** *雞禽,* ***相思, 畫眉,*** ***八哥, 鶇鳥,*** ***鵯, 喜鵲*** ***鵲鴝***

4		*Commercial Songbird/ Chicken feed* *Plus* *Insects* *Leafy vegetable* *普通雞料, 及昆蟲* *葉子, 蔬菜*	*Chickens* ***Pheasants,*** ***Water hens,*** ***Rails,*** ***Quails.*** ***雞,*** ***雉雞,*** ***水雞,*** ***鵪鶉***
5		*Quail* *Mice* *Chicks* *(From frozen properly defrosted in coldwater)* *鵪鶉, 老鼠 小雞* *(箱取出, 放入冰水解凍)*	*Eagles,* ***Owls,*** ***Hawks,*** ***Falcons,*** ***Kites.*** ***鷹,*** ***貓頭鷹,*** ***雀鷹,*** ***隼***
6		*Commercial parrot food,* *Sunflower seed* *Plus* *Fruit/Vegetable* *(larger pieces are O.K.)* *普通鸚鵡料, 向日葵種子* *及水果或, 蔬菜* *(大件便可)*	*Parrots,* ***Parakeets,*** ***Lories,*** ***Lorikeets,*** ***Lovebirds,*** ***Cockatoos.*** ***鸚鵡***
7		*Live fish/shrimp* *Defrosted fish/frogs* *Chicks /mice* *(size to fit bird bill/mouth)* *活魚/小蝦, 急凍魚/* *青蛙, 小雞/老鼠* *(食物大小按雀鳥體型)*	*Egrets,* ***Herons,*** ***Bitterns.*** ***鷺***

Appendix 19 Bird Weights and Feeding Guidelines

Kadoorie Farm & Botanic Garden
K F B G 嘉道理農場暨植物園

H.K. BIRD WEIGHTS & DIET REFERENCE

SPECIES	WEIGHT RANGE			DIET			
	Pre Fledge	Sub Adult	Adult	*Diet No.	Food Type	Min. Quantity per day	Bill Type
Grey Heron *Ardea cinerea*		1kg	1.2-1.35kg	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (30 fish)	
Chinese Pond Heron *Ardeola bacchus*		170-250g	250-350g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (15 fish)	
Night Heron *nycticorax nycticorax*		280-330g	300-600g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (200 fish)	
Little Green (Striated) Heron *Butorides striatus*		149g	160-200g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (15 fish)	
Cattle Egret *Bubulcus ibis*			230-350g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (15 fish)	
Great Egret Egretta *alba*	400g		700-1.1kg	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (30 fish)	
Intermediate Egret Egretta *intermedia*			400g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (20 fish)	
Pacific Reef Egret *Egretta sacra*			550g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (20 fish)	
Little Egret *Egretta garzetta*	0-200g	180-350g	300-440g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (20 fish)	
Yellow Bittern *Ixobrychus sinensis*			50-80g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (10 fish)	
Chestnut (Cinnamon) Bittern *Ixobrychus cinnamomeus*			80-120g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (10 fish)	
Black Bittern *Dupetor flavicollis*		140-240g	200-270g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad Lib (15 fish)	
Schrenks Bittern *Ixobrychus eurhythmus*		95g - 113g	60-105g	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (10 fish)	
Black Faced Spoonbill *Platalea minor*			1.2-1.7kg	7	Variety of insects, amphibians, small fish, crustaceans.	Ad lib (30 fish)	
Common Shelduck *Tadorna tadorna*			900g-1.2kg		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Ruddy Shelduck *Tadorna ferruginea*			1-1.3kg		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Northern Pintail *Anas acuta*			700-900g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Northern Shoveler *Anas clypeata*			450-650g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Eurasian Wigeon *Anas penelope*			500-700g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Common Teal *Anas crecca*			250-350g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Gargany *Anas querquedula*			300g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Mandarin Duck *Aix galericulata*			250-300g		Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
White fronted Goose *Anser albifrons*					Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Swan Goose *Anser cygnoides*					Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Bean Goose *Anser fabalis*					Poultry/ Duck pellets, cracked corn, millet, green vegetables	Ad lib	
Japanese Quail *Coturnix japonica*			60-70g	4	Insects, crustaceans, seed, chicken feed, plant matter.	Ad lib	

Kadoorie Farm & Botanic Garden
嘉道理農場暨植物園

H.K. BIRD WEIGHTS & DIET REFERENCE

SPECIES	WEIGHT RANGE			DIET			
	Pre Fledge	Sub Adult	Adult	*Diet No.	Food Type	Min. Quantity per day	Bill Type
Yellow Legged Button Quail *Turnix turnix*		49g	50g	4	Insects, crustaceans, seed, chicken feed, plant matter.	Ad lib	
Slaty-breasted (Banded) Rail *Gallirallus striatus*		120g	100g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Band-bellied Crake *Porzana paykuli*			95-110g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Slaty-legged Crake *Rallina eurizonoides*		77-102g	100g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
White Breasted Waterhen *Amaurornis phoenicrus*	40-100g	100-130g	120-190g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Watercock *Gallirallus cinerea*			180-295g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Common Moorhen *Gallinula chloropus*			200-220g	4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Pheasant Tailed Jacana *Hydrophasianus chirugus*		161g		4	Insects, molluscs, crustaceans, seed, plant matter.	Ad lib	
Grey Headed Lapwing *Vanellus cinerus*		218-253g			Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Black Winged Stilt *Himantopus himantopus*		134g			Molluscs, insects, diatoms, brine shrimp.	Ad lib	
Pied Avocet *Recurvirostra avosetta*			260-290g		Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Black-Tailed Godwit *Limosa limosa*		140g			Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Eurasian Curlew *Numenius arquata*		640g			Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Spotted Redshank *Tringa erythropus*			120-150g		Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Common Sandpiper *Actitis hypoleucos*					Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Sharp-tailed Sandpiper *Calidris acuminata*		68g			Insects, Larvae, molluscs, worms, some vegetable matter, seeds.	Ad lib in soil	
Eurasian Woodcock *Scolopax rusticola*			180-300g		Earthworms & Insects	Ad lib in soil	
Greater Painted Snipe *Rostratula benghalensis*		101-112g	110-125g		Earthworms & Insects	Ad lib in soil	
Common/ Fan Tailed Snipe *Gallinago gallinago*			75g		Earthworms & Insects	Ad lib in soil	
Streaked Shearwater *Calonectris leucomelas*		287g	440-588g	7	Mainly Fish	Ad lib	
Black tailed Gull *Larus crassirostris*		357g	508g	7	Mainly Fish	Ad lib	
Herring Gull *Larus argentatus*		950g		7	Mainly Fish	Ad lib	
Black-Headed Gull *Larus ridibundus*			170-250g	7	Mainly Fish	Ad lib	
Common Tern *Sterna hirundo*			70-100g	7	Mainly Fish	Ad lib	
Spotted Dove *Streptopelia chinensis*	up to 60g	60-110g	110-140g	1	Corn, beans, peas, seeds, cereals & soft fruits	Ad lib	
Emerald Dove *Chalcophaps indica*			82-110g	1	Corn, beans, peas, seeds, cereals & soft fruits	Ad lib	
Feral Pigeon *Columba livia*			274g	1	Corn, beans, peas, seeds, cereals & soft fruits	Ad lib	
Oriental Cuckoo *Cuculus saturatus*		82g	75g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib (insects main diet)	

Kadoorie Farm & Botanic Garden
K F B G 嘉道理農場暨植物園

H.K. BIRD WEIGHTS & DIET REFERENCE

SPECIES	WEIGHT RANGE			DIET			
	Pre Fledge	Sub Adult	Adult	*Diet No.	Food Type	Min. Quantity per day	Bill Type
Large Hawk Cuckoo *Hierococcyx sparverioides*			118g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib (insects main diet)	
Hodgson's Hawk Cuckoo *Hierococcyx fugax*			71g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib (insects main diet)	
Koel *Eudynamis scolopacea*	up to 104g	100-160g	160-250g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib (insects main diet)	
Greater Coucal *Centropus sinensis*	up to 200g	200-260g	270-350g	3	Song Bird feed/chicken feed, Insects, soft fruits, meat	Ad lib (insects main diet)	
Lesser Coucal *Centropus bengalensis*			70-110g	3	Song Bird feed/chicken feed, Insects, soft fruits, meat	Ad lib (insects main diet)	
Red Winged Crested Cuckoo *Clamator coromandus*			69g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib (insects main diet)	
Savanna Nightjar *Caprimulgus affinis*			80g		Insectivore (minced beef & insect mash)	May need to be hand fed	
Grey Nightjar *Caprimulgus indicus*		111g	90g		Insectivore (minced beef & insect mash)	May need to be hand fed	
Common Kingfisher *Alcedo atthis*			17-30g	7	Fish, shellfish, Insects	Ad lib (10 fish)	
White-breasted Kingfisher *Halcyon symrnensis*		84g	78g	7	Fish, shellfish, Insects	Ad lib (10 fish)	
Blyths Kingfisher *Alcedo hercules*			60-70g	7	Fish, shellfish, Insects	Ad lib (10 fish)	
Little (House) Swift Apus affinis	up to 18g	18-25g	20-30g		Insectivore (minced beef & insect mash)	Must be hand fed	
Barn Swallow *Hirundo rustica (gutturalis)*			14g		Insectivore (minced beef & insect mash)	Must be hand fed	
Oriental Skylark *Alauda gulgula*			44g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Tree Sparrow *Passer montanus*	9-14g	19-22g	20g	2	Mixed seeds, insects, soft fruit	Ad lib	
Red-whiskered (Crested) Bulbul *Pycnonotus jocosus*	17g	24g	30-49g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Chinese Bulbul *Pycnonotus sinensis*		27g		3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Black Bulbul *Hypsipetes leucocephalus*			45-50g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Bohemian Waxwing *Bombycilla garrulus*		45-55g Summer/ 55-65g Winter		3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Oriental Magpie Robin *Copsychus saularis*	18-23g	30g	34-42g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Blue (Violet) Whistling Thrush *Myophonus caeruleus*	up to 90g		128-140g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Blackbird *Turdus merula*			100-104g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
White's (Scaly)Thrush *Zoothera dauma*			123g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Lanceolated Warbler *Locustella lanceolata*			12g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Pallas's Leaf Warbler *Phylloscopus proregulus*			5g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Black-Faced Laughing Thrush *Garrulax perspicullatus*			100-130g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Hwamei *Garrulax canourus*			45-60g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Fork Tailed Sun Bird *Aethopyga christinae*			5g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Japanese White-Eye *Zosterops japonica*		6g	7-11g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Brown Shrike *Lanius cristatus*			21g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Silver Oriole *Oriolus mellianus*			70-80g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Common Magpie *Pica pica*		90-160g	110-180g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Blue Magpie *Urocissa erythrorhyncha*			120-150g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Crested Myna *Acridotheres cristatellus*			50-111g	3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Black-necked Starling *Sturnus nigricollis*	75g			3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	

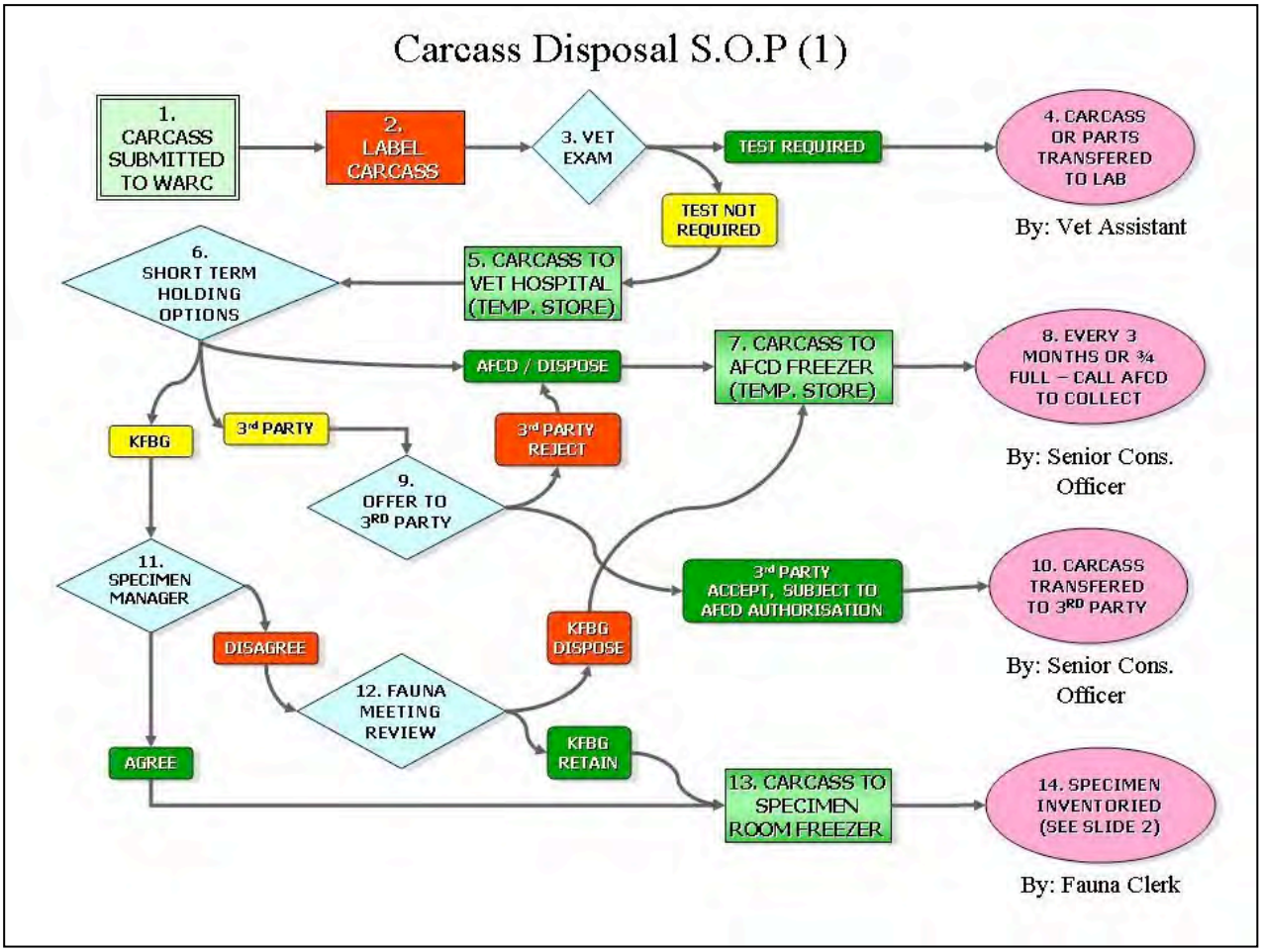
Kadoorie Farm & Botanic Garden
K F B G 嘉道理農場暨植物園

H.K. BIRD WEIGHTS & DIET REFERENCE

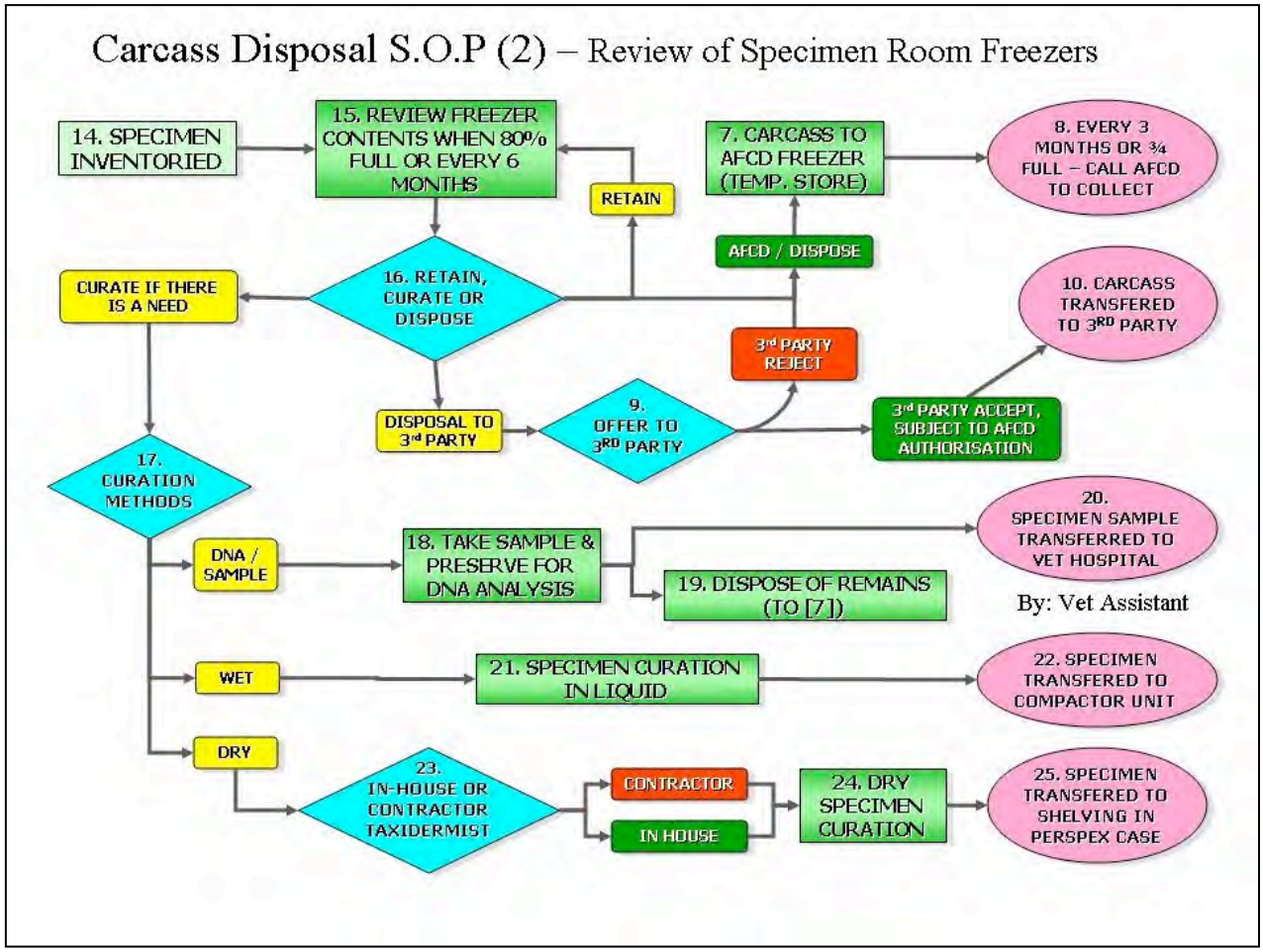
SPECIES	WEIGHT RANGE			DIET			
	Pre Fledge	Sub Adult	Adult	*Diet No.	Food Type	Min. Quantity per day	Bill Type
Silky Starling (Red Billed Starling) *Sturnus sericeus*		60g		3	Song Bird feed/chicken feed, Insects & soft fruits	Ad lib	
Spotted Munia *Lonchura punctulata*			9g	2	Mixed seeds, insects, soft fruit	Ad lib	
White backed Munia *Lonchura striata*			13g	2	Mixed seeds, insects, soft fruit	Ad lib	
Birds of Prey	**Juvenile**	**Male**	**Female**				
Bonelli's Eagle *Hieraaetus fasciatus*		1995g		5	mice,day old chicks	5	
Black Kite *Milvus migrans (lineatus)*		650g-900g	750g-1.2kg	5	mice,day old chicks & fish	3	
Common Buzzard *Buteo buteo*		450-650g	550-900g	5	mice,day old chicks & fish	3	
White-Bellied Sea Eagle *Haliaeetus leucogaster*		2-2.8kg	2.2 - 3kg	5&7	mice,day old chicks & fish	6	
Black-Shouldered Kite *Elanus caeruleus*		218-230g	230-275g	5	mice,day old chicks	2	
Crested Goshawk *Accipiter trivirgatus*		220-450g	400-700g	5	mice,day old chicks	2	
Saker Falcon *Falco Cherrug*			800g-1.2kg	5	mice,day old chicks	3	
Japanese Sparrowhawk *Accipiter gularis*		100-120g	110-160g	5	mice,day old chicks	1	
Besra *Accipiter virgatus*		125-140g	170-246g	5	mice,day old chicks	1	
Crested Serpant Eagle *Spilornis cheela*		860g-1.6kg	1.3-1.9kg	5	mice,day old chicks	4-5	
Grey- Faced Buzzard *Butastur indicus*		280-400g	350-550g	5	mice,day old chicks	2	
Common Kestrel *Falco tinnunculus*		120-170g	130-190g	5	mice,day old chicks	1	
Amur Falcon *Falco amurensis*			163g	5	mice,day old chicks	1	
Hobby *Falco subbuteo*		130-155g		5	mice,day old chicks	1	
Peregrine Falcon *Falco peregrinus*		400-600g	600g-1kg	5	mice,day old chicks & fish	3	
Eastern Grass Owl *Tyto longimembris*		300-400g	350-450g	5	mice,day old chicks	2	
Oriental Scops Owl *Otus sunia*		60-80g	70-90g	5	mice,day old chicks	1	
Mountain Scops Owl *Otus spilorephalus*			70-100g	5	mice,day old chicks	1	
Collared Scops Owl *Otus lempiji*	80-120g	120-160g	140-180g	5	mice,day old chicks	1	
Asian Barred Owlet *Glaucidium cuculoides*	100-130g	130-185g	150-200g	5	mice,day old chicks	1	
Brown Hawk Owl *Ninox scutulata*			181-225g	5	mice,day old chicks	1	
Eurasian Eagle Owl *Bubo bubo*		1.2-1.6kg	1.5-2.2kg	5	mice,day old chicks	4-5	
Brown Fish Owl *Ketupa zeylonensis*		1.1-1.3kg	1.3-1.6kg	5&7	mice,day old chicks & fish	4-5	

NOTE: * Diet No. refers to the Rough Bird Feeding Guide Appendix

Appendix 20 Carcass Disposal 1



Appendix 21 Carcass Disposal 2



Appendix 22 ARKS Taxon Report

Report Start Date
1/1/1900

Taxon Report for Hylobates

Report End Date
31/10/2008

K375 ***Hylobates leucogenys*** **IZY Data DeficientA** **White-cheeked gibbon**

Date in	Acquisition - Provider/local Id	Holder	Disposition - Recipient/local Id	Date out
10 Feb 2000	Loan In from AFCD-UNK	KADOORIE	Ship to PINGTUNG-UNK	26 Jun 2007

Sex-Contraception: Female -
Hybrid status: Not a hybrid
Enclosure: WML4OT
Rearing: Hand
Transponder ID: 029124778 - Mid spine
Birth type: Unknown
Birth Location: Unknown Location
Birthdate-Age: ~ 2000 - 7Y,4M,14D +/-04 Yr. at transfer
Permit: AF CON 09/51 - OTHER

K14 ***Hylobates syndactylus*** **Lower Risk - Near T** **Siamang**

Date in	Acquisition - Provider/local Id	Holder	Disposition - Recipient/local Id	Date out
15 Oct 1999	Donation from, Rescue/Rehabilitation AFCD-UNK	KADOORIE	Term Free Disposition, Rescue/Rehabilitation MELAK	13 Apr 2005

Sex-Contraception: Male -
Hybrid status: Not a hybrid
Enclosure: WMR1OT
Sire: WILD at UNKNOWN
Rearing: Hand
Transponder ID: 045555589 - shoulder center
Birth type: Wild Born
Birth Location: Unknown Location
Birthdate-Age: ~ Jan 1601 - 404Y,3M,7D +/-03 Mo. at transfer
Dam: WILD at UNKNOWN
Permit: AF CON 09/51 - OTHER

Appendix 23 ARKS Specimen Report

Report Start Date 1/1/1900

Specimen Report for KADOORIE / K14

Report End Date 31/10/2008

Taxonomic name: *Hylobates syndactylus* — Family: Hylobatidae

Common name: Siamang — Order : Primates

Current information

Sex:	Male	Sire ID:	WILD at Unknown Location
Birth type:	Wild Born	Dam ID:	WILD at Unknown Location
Birth Location:	Unknown Location	Rearing:	Hand
Birthdate-Age:	~ Jan 1601 - 404Y,3M,7D +/-03 Mo. at t	Hybrid:	Not a hybrid
Time since last Acq:	5Y,5M,28D as of transfer to MELAKA		

Date in	Acquisition - Provider/local Id	Holder	Disposition - Recipient/local Id	Date out
15 Oct 1999	Donation from, Rescue/Rehabilitation AFCD / UNK	KADOORIE / K14	Term Free Disposition, Rescue/Rehabilitation MELAK	13 Apr 2005

Date	Identifier type	Identifier	Location	
15 Oct 1999	Permit	AF CON 09/51	OTHER	Operation of KFBG Wild Animal Rescue Center Permit - Issued by Agriculture Fisheries & Conservaion Department, Govt HK.
15 Dec 1999	Transponder ID	045555589	shoulder center	

Date	Type	Value	Units
14 Dec 2004	live animal weight	10.75	kilogram

Date	Note type	
20 Aug 2004	Medical notes	last of panacur, stop -check faeces to murrow
14 Dec 2004	Note	Blood sample in buffer and hair pluck in 99% alcohol taken during exam, stored with all other samples in screw top tub in vet fridge.
14 Dec 2004	Medical notes	Annual Check up / Pre shipment procedures. Rx 0.5 cc Zoletil IM, 4 mins later anaesthetised and moved to hospital. Rx 50 c warmed Hartmans s/c. RR 30 bpm - 28 bpm during entire procedure. Blood collected(10cc) for Viral screening to be sent to Gov Lab (Trevor Ellis) Rx 0.1 cc Bovine TB L eyelid & 0.1 cc Avium TB R eyelid. 2.2 cc Droncit s/c 0.22 cc Ivomec s/c. Relapse of skin problem with alopecia / hyperkeratosis to dorsum of hands / carpal regions. Teeth fine. Wash in Perythrin based shampoo.Rx 0.25 cc Zoletil as top up dose. Rinsed with warm water, then towel dry / hair dryer. Xray (# 993) Faecal sample collected: NAD 2.45 pm: Still slightly sedate from GA. Keep in hospital (Boxed) until 5pm to recheck.
15 Dec 2004	Medical notes	TB : No r/n L & R eye
16 Dec 2004	Medical notes	TB: No r/n L & R eye.
20 Dec 2004	Medical notes	D/W, Panacur 5.4cc mixed with bread, taken.
22 Jan 2005	Note	Changed: Vendor custom <AFCDESP> with <AFCD> Mnemonic Validation: 1/22/2005 12:00:40 PM
13 Apr 2005	Disposition note	Animal shipped AM via Malaysian airlines to Melaka Zoo Malaysia. AWB # 232 63240660 Box, 70.5 KG including Gibbon, Volume weight 90KG box 103x65x80 Freight Charge ~$2650 handling fee -$262 Animal travelled un sedated not special treatment. Chased into box with only partial net use, not full capture and restraint used. Quite relaxed in box/during transport. Cool day on departure.

Date	Enclosure
21 Feb 2005	WMR1OT

Date	Rearing
15 Oct 1999	Hand

Date	Parent(s)	local Id	Location
15 Oct 1999	Sire	WILD	UNKNOWN
15 Oct 1999	Dam	WILD	UNKNOWN

Appendix 24 ARKS Enclosure Report

Report Start Date 1/1/1900 — Enclosure Report for Animalia within CTPJ — Report End Date 31/10/2008

KFBG\EXHIBITION\CTPJ\CTPJ1

K1531	*Cynopterus sphinx*	~ May 2008 - 0Y,5M,29D +/-1 Mo.	Unknown	CTPJ1	Short-nosed fruit bat
K1502	*Cynopterus sphinx*	~ Apr 2008 - 0Y,1M,4D +/-1 Mo. at transfer	Unknown	CTPJ1	Short-nosed fruit bat
K1499	*Cynopterus sphinx*	~ Apr 2008 - 0Y,6M,21D +/-1 Mo.	Male	CTPJ1	Short-nosed fruit bat
K1338	*Cynopterus sphinx*	~16 Aug 2007 - 1Y,2M,15D +/-07 Days	Male	CTPJ1	Short-nosed fruit bat
K1327	*Cynopterus sphinx*	~ Aug 2007 - 1Y,2M,25D +/-1 Mo.	Unknown	CTPJ1	Short-nosed fruit bat
K1326	*Cynopterus sphinx*	~ 6 Aug 2007 - 1Y,2M,25D +/-07 Days	Female	CTPJ1	Short-nosed fruit bat
K1209	*Cynopterus sphinx*	5 Apr 2007 - 1Y,6M,27D	Female	CTPJ1	Short-nosed fruit bat
K1208	*Cynopterus sphinx*	3 Apr 2007 - 1Y,6M,29D	Male	CTPJ1	Short-nosed fruit bat
K1205	*Cynopterus sphinx*	~28 Mar 2007 - 1Y,7M,6D +/-10 Days	Male	CTPJ1	Short-nosed fruit bat
K832	*Cynopterus sphinx*	8 Oct 2006 - 2Y,0M,23D	Female	CTPJ1	Short-nosed fruit bat
K829	*Cynopterus sphinx*	5 Oct 2006 - 2Y,0M,26D	Male	CTPJ1	Short-nosed fruit bat
K760	*Cynopterus sphinx*	~17 Jun 2006 - 2Y,4M,14D +/-1 Day	Male	CTPJ1	Short-nosed fruit bat
K491	*Cynopterus sphinx*	11 May 2005 - 3Y,5M,21D	Female	CTPJ1	Short-nosed fruit bat
K369	*Cynopterus sphinx*	~21 Jul 2002 - 6Y,3M,11D +/-07 Days	Male	CTPJ1	Short-nosed fruit bat
K368	*Cynopterus sphinx*	16 Aug 2003 - 5Y,2M,15D	Female	CTPJ1	Short-nosed fruit bat
K361	*Cynopterus sphinx*	~ Sep 2002 - 6Y,1M,4D +/-02 Mo.	Female	CTPJ1	Short-nosed fruit bat
K169	*Muntiacus muntjak*	~ Oct 2000 - 8Y,0M,24D +/-1 Mo.	Male	CTPJ1	Indian muntjac
K16	*Muntiacus muntjak*	~ Mar 2004 - 4Y,7M,27D +/-1 Mo.	Female	CTPJ1	Indian muntjac

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