

RAPTOR RESCUE AND FIRST AID MANUAL FOR THE GENERAL PUBLIC



KENYA BIRD OF PREY TRUST

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1. Introduction

This manual is a “how to” guide in the rescue, emergency treatment and housing of an injured bird of prey. We give advice on the initial capture, restraint, handling, feeding, care and first aid treatments for individuals with no prior experience. The aim is that the bird is stabilised prior to moving to a centre.

Standard veterinary practices adopted in Kenya for managing small animals are in general inappropriate and in some cases potentially lethal for raptors. Common mistakes made are covered below, but should a qualified small domestic animal vet be involved in a raptor rescue they must be forwarded pertinent information. The commonest mistake is to place the raptor in an inappropriate cage, feed inappropriate food, provide trays of water, administer corticosteroids and antibiotics (often of no therapeutic benefit), and release immediately in fear of legal retribution for keeping a wild animal. They may be too quick to euthanize raptors that are, even if they cannot ever be released, invaluable for other conservation options.

In our training courses we have asked why there is a prevalence of inhumane cruel treatment of raptors even by wildlife professionals, to get the reply that raptors are considered as useless as snakes and should be killed. Such attitudes will prevail until the public is able, like in much of the developed world, to have the opportunity to see raptors up close and personal. Rescuing a raptor galvanises a wide sector of people and is a powerful education tool that has made a tangible positive impact. This in turn creates a sense of pride and accountability for wildlife conservation.

Raptors are more robust and easier to handle than most forms of wildlife and so can live to suffer the initial inevitable trauma and manhandling of the average person, whereas a small bird or many wild mammals would quickly die. Raptors are intelligent too, responding almost immediately to care and will readily eat. They will correctly interpret feeding gestures, as it is within their own behavioural vocabulary. Their ability to survive capture and trauma may explain why they are one of the few wild animals that do find their way into public hands.

This rescue manual is aimed at those who may encounter a raptor in need of help, from the moment of its discovery to its delivery to a rescue facility. Individuals who work in wildlife areas, such as professional guides, conservancy managers, National Park/ Conservancy /government personnel and rangers as well as growing bird conservation groups, are certain to encounter raptors in need of emergency care.

2. The rescue steps in brief

- Pick up the raptor with no risk to either the raptor or the rescuer.
- Make a rapid evaluation of the cause of injury, e.g. an unfledged young bird, a trauma victim (NB the type and location of injury) or a poisoning and relay this information to authority and rehab centre.
- Place it in a secluded box and remove it from the field to a safe warm location.
- If you witness a large wildlife poisoning incident, inform relevant wildlife officers immediately and gather as much photographic evidence of the crime as possible. Keep all photos and messages as evidence.
- Offer First Aid), oral fluids, realign limbs, clean wounds and if poisoned immediately administer appropriate treatment outlined herein.
- Be prepared to keep the raptor for days before it is evacuated.
- Be prepared to advise vets or authorities on the proper care of a raptor (using this manual).
- Keep records of the event, species, age, numbers of individuals, location, cause of injury, individuals involved in rescue as well as those probably responsible for persecution, the authorities informed, the method used in the rescue, basic treatment and destination. Record death if it occurs.
- Avoid social media such as Facebook, Twitter etc as this complicates matters with often conflicting and inappropriate advice. Amateur public international peer pressure may push for improper management and hurried release that will kill the bird.
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3. When to rescue a raptor

We have seen many cases where obviously injured, sick or poisoned raptors have been left alone to die in the field under the assumption that they are “tame”. An article in Swara Magazine, showing a near-death European Hobby on the ground, stated the bird was exceptionally tame due to Kenya’s cultural deep respect for wildlife. That the editors and all but very few readers did not see that the hobby was critically ill and would certainly have died shortly after the photo was taken, says a great deal about the need to educate the public as well as an idealistic but irrational “hands off” ethical standpoint.



Found sick at Ragia forest 12:13

Examples of raptors that were found sitting on the ground in desperate need of help. The African Hobby found in Tanzania was rescued but sadly died shortly afterwards because of difficulty in providing fluids. Note the highly stressful proximity of a large dog. Such an unnecessary threat greatly lessens the chances of a successful outcome. The Steppe Buzzard was left where it was found and would soon die of dehydration/starvation and/or persecution. Social Media is a great way to circulate an emergency, but poor amateur feedback can influence people to make bad decisions.

For the record, any raptor that allows close approach by a human, has half-closed eyelids, drops its wings to steady itself, is on the ground will die unless rescued.

4. Rescuing a raptor

1. The rescuer must respond to a raptor in need as quickly as possible. Minutes matter especially so in poisoning and trauma cases. Rescues in the field require little more than immediate access, careful physical restraint, and placement in a warm box with no visual access followed by a rapid trip to a rescue facility. Mistakes, delays and unnecessary stresses in the initial management made during the first few hours of rescue can ruin chances for success later.
2. Throughout the rescue and during the initial part of its treatment in confinement, the rules remain the same: zero disturbance, warmth, subdued light and provision of oral fluids. The urgency for fluids is well understood by most people but they may assume that a bowl of water provided in the box is sufficient. Not only will the raptor have no idea of water being in a bowl, the chances of it spilling the water over its body is a certainty which will lead to rapid heat loss. The provision of water in a bowl is therefore not only pointless but dangerous.
3. Provision of oral fluids via a pipe is conducted on site in cases of poisoning and with birds that have evidently been without food for more than a day, or have suffered severe blood loss or physical injury. If it must be kept overnight it must have water and all effort must be taken to find a suitably sized tube.
4. Food needs to be fresh red meat with no fat or bone and in a sufficient quantity for the bird, given only after rehydration and when stabilised.
5. Throughout the rescue it is imperative to inform KWS, Conservancy managers (if on or near a conservancy) and local authority as well as our centres. This is especially required if there is an obvious mass poisoning event. SMS and WhatsApp messages should be kept as evidence of making contact.
6. Contact Kenya Bird of Prey Trust team to discuss next steps (see [contact details](#) on page 2).

5. Capturing and restraining the sick or injured raptor

It is quite possible to restrain all raptors bare handed and it's advisable to do so as gloves make the task more difficult because one must apply more pressure to get sufficient grip. Surgical rubber gloves provide no physical protection and given that there is no record of a single zoonotic transmission of a disease from a raptor to a human in Africa it must not be considered a necessity (unless there is reason to suppose it has a transmissible disease). However, when handling poisoned vultures that may vomit, rubber gloves are advised. Most people do not carry gloves and they must improvise by using a piece of cloth, towel, Jacket, shirt, car mat, etc. Washing hands (or use of hand sanitiser) after handling a sick or poisoned raptor is advised if the bird is suspected to have a disease. Today hand sanitizer is often to hand due to COVID.

The beak of a raptor is the least dangerous weapon, only capable of giving at most a painful nip (Falcons, vultures and eagle-owls tend to bite, all others usually stare open mouthed). It's the feet that need careful consideration and management.

Although the feet can be dangerous weapons, never tie both legs together with rope, string, wire and especially rubber inner tube. The latter will restrict all blood flow and kill the feet in hours. We have seen rubber inner tubes used many times even by those trained to rescue poisoned vultures and it must stop. Never tie one leg only as it will almost certainly injure or break that leg. In an emergency and when no other solution is available to house the raptor the use of make-shift jesses and leash is an option. Loosely but firmly tie to each leg (tarsus) at equal length with a soft material (as in jesses), then tie to these a short "leash" which is in turn tied to a fixed object. Be very careful that the bird doesn't thrash around in panic. Placed in a quiet area such use of make-shift jesses (shoe laces) and leash (string) may be all one can improvise on the spot.

Let us presume the injured raptor is a medium size bird, such as an Augur Buzzard. The bird is on the ground, has a fierce stare and threatening posture. What do you do?

1. Quickly approach and restrain the bird by first throwing a towel or shirt over it. If it has any strength it will roll on its back and try to foot the material allowing you to take hold of both feet. If it struggles and flies away, do not assume it will survive so try to chase and catch it.

2. If its head is covered, cautiously and quickly grab both legs just above the feet, one in each hand. Then transfer both feet into one hand. Place one finger between the tarsi and gently, but firmly get both feet under control. Never grip both legs together so that the legs cross as this can cause immense strain and can injure the legs, especially if it flaps. The pressure must not harm the bird. Imagine gripping an egg so that no one can remove your fingers but not harming the egg. If the bird flaps sideways, move your hand so that it moves with the bird, otherwise the legs can break.
3. With the other hand fold up the wings to a natural position and then bring it up gently to your body in an upright position. Never have it hanging, flapping upside-down and never keep it on its back for more than a few minutes. Gently cuddle it with its side or back against your chest as you would a baby. Your body heat may benefit the bird if it is cold, so keep it close. Keep the material over its head. Hide it from outside stimuli of every kind, especially curious people. Above all exercise care and compassion. Do not make a big scene with lots of people making noise and taking selfies. Do not beat it into submission or push it around with sticks (as we have seen). An Augur Buzzard is quarter the weight of a domestic cat, and far less dangerous.
4. The use of a hood (covering of the head) is extremely useful in all diurnal raptors. On vultures, hoods have variable effects, some become immediately “sedated” and calm, while others fight against it, preferring instead to see what is going on. In the absence of a hood place a dark shirt or material over the head.
5. Place it in a large cardboard box, or enclosed room with soft material for it to lie down on.
6. Make [contact with our centres](#) and we will talk you through the next steps.

Correctly holding a raptor

Below pictures show how to correctly hold a raptor. On the far left is one of our raptor technicians holding a Wood Owl with the little fingers separating the feet and the other fingers gently encircling the body. We deliberately include pictures of children, who are very familiar with handling captive and wild hawks, to show that the procedure requires technique and not brute force. They too are separating the legs by placing the forefinger between them. The Crowned Eagle, Africa's most powerful eagle, on the right is being held with one tarsus in each hand because this bird is well capable of causing serious injury. Note the calm and respectful attitude of the handlers.



Note that the feet are separated and not allowed to grip themselves or their own body.

Incorrectly holding a raptor

The pictures below show incorrect and brutal methods that risk bone and feather fractures and strangulation. These birds are undergoing tremendous and totally unnecessary stress. A vulture is being hung from its neck and wing tip, an Augur Buzzard (at a recognized zoo) from its wing tips (and one leg tightly tied by a long piece of string) and the picture on the right shows a man gripping both feet against the alignment of the legs and pulling back the head with heavy gloves.



On the left a Tawny Eagle has both legs gripped tightly together and the neck gripped and pulled away from the body. The eagle later died. On the right is a Crowned Eagle hung from its wings above the ground and one leg is tied tightly with a rope. The left wing was completely fractured with exposed bones but this did not deter brutal treatment.



6. Why separate the feet?

We emphasise the need to separate the feet of raptors to avoid them :

- Being crushed forcefully against each other risking injury.
- To stop the feet from clutching each other causing self-inflicted injury.
- To stop self-inflicted injury to their torso or limbs.
- To prevent injury to the person holding the bird.

7. Handling poisoned Vultures

Poisoned birds of prey can be recumbent and totally submissive requiring nothing more than picking up and placing in a large box. The wings need to be gently restrained to the body, legs held with one finger separating the tarsus (never gripped together crushing one upon the other). With vultures, use the other hand to gently restrain the back of the head and pull the head away from being able to bite the handler. This is not necessary for eagles or hawks because they seldom bite.

If the bird flaps and breaks free, make all effort to ensure the legs are not released (but don't crush the legs). Never hold any raptor by the wings or head, always by the legs and close to the body, in a level or upright position.

Pictures below show the correct method of holding a sick vulture. NB the use of a shirt to cover the head in the left photo. The juvenile White backed Vulture on the right is being held in the same manner and a cover will be put over the head after the photo. Curiously some vultures struggle less if bare headed.



The drawing shows the forefinger of the left hand dividing the tarsus and the right hand holding the wing to the body. The head would be covered with a towel. With eagles, hawks and owls there is no need to physically hold the head away as they have short necks and seldom bite. With vultures however the right hand will hold the neck at the base of the skull as shown in the photos above.



8. Contact our team to start the rescue operation

Now contact Kenya Bird of Prey Trust to discuss next steps. The best thing for the bird may be its immediate transport to one of our holding facilities. Be assured that this will not be the last you see of it as those who will take it on will always encourage your interest and invite you to see the bird later, perhaps even asking if you could release it when it has recovered. But first make sure it will survive the journey.

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9. Assessing the injury or problem

Supposing the bird is now cradled gently in your arms, head covered and feet held. Try to establish the cause of illness or injury. Did it impact a car, power line, fence and break a wing? Is it very recently hurt or is it diseased? Is it young and incapable of prolonged flight? This information is vital and needs to be forwarded to the authorities and the rescue centre prior to movement.

Fractures

Swellings may indicate fractures. Bruises seldom seriously incapacitate the bird especially when picked up as a wild bird. Wing fractures are by far the most common fractures seen due to the fact that a bird is immediately unable to escape. Leg and other fractures alone are less common and accompanied by starvation. Fractures require immediate attention, but foremost is the need to return any bone ends into the skin (after it is cleaned with water) in order to save the bone. Exposed to air for a few hours the bone dies and the surgeon will have to remove the dead bone.

Concussion

If a bird has hit a window, treat it as an emergency requiring weeks of care, not hours. Birds have brains that meet the skull, and eyeballs that meet one another and the brain. Hitting windows results in brain damage and often eye damage that includes retinal detachment, lens displacement and the fracture of the supraorbital bony “eyebrow”. Prognosis for full recovery is reasonable if handled as an emergency, near zero if released hours after impact.

Electrocution

Electrocution is rapidly becoming the leading cause of raptor mortality in Kenya. Electrocuted birds with dying limbs can be found hundreds of km from lethal powerlines so it is important to consider this eventuality wherever the raptor was found. Look for a curled foot with darkened underside, and a tiny spot of blood on the opposite carpal (hand). The foot and wing may have burnt feathers, and a smell of burnt hair. Security fence electrocution and collision damage is also a problem with very high volts in excess of 32,000 volts carried in very thin almost invisible wires, being able to stun birds and cause convulsive muscle retraction and tissue necrosis.



Examples of electrocution burns on the foot and wing of a Martial Eagle. These quickly start to rot and flies will lay their maggots in the wounds. Maggots are very serious and will eat living flesh. They must be removed and the site cleaned immediately.

Poisoning

Red Billed Quelea spraying probably kills hundreds of times more raptors than the more famous poisoning of vultures in retaliation for carnivores killing livestock. Locust control too must kill a good percentage of the tens of thousands of migrant raptors and birds that gear their entire migration cycle to hit locust and quelea eruptions. On cereal farms more complex routes for pesticides may take place with a much greater application of various chemicals from fungicides, insecticides, seed dressings, silica gel etc. Cattle dip has also poisoned many birds and raptors too. Deliberate bird poisoning for human consumption is very prevalent in Kenya wherever rice is grown with a very high probability of significant mortality of local and especially migrant raptors. These patients vary in severity but if they are able to be picked up they cannot recover without chemical reversal treatment. They must be put in a dark, warm and quiet spot as stress will very easily kill them before treatment. Massaging the crop contents out of the bird, washing out the crop and stomach with a pipe, and injections with atropine must be implemented immediately.

Direct persecution

Raptors are heavily persecuted in Kenya, owls especially. They are rarely shot as firearms in civilian hands are very few, but they are stoned, trapped, poisoned, catapulted and shot with arrows etc. Surviving raptors who have been deliberately attacked are often mutilated once grounded and feathers are typically pulled out and limbs fractured.

Collision

Raptors lead fast lives and often hit fence wires, electricity wires, guy ropes on cell phone towers, wind turbine blades, and vehicles. Game proof fences, electric security fences, and sheep fencing is particularly lethal. These often have fractured long bones. Fractures require immediate attention, but foremost is the need to return any bone ends into the skin (after it is cleaned with water) in order to save the bone. Exposed to air for a few hours the bone dies and the surgeon will have to remove the dead bone.

Intra and Inter-specific aggression

One of the few natural causes of mortality in wild raptors is fighting with the same species or with other raptor species. Often these birds have deep puncture wounds, fractures and intraocular intrusions, and these must be treated as emergencies. This is particularly so with super high densities of Fish Eagles at Lake Naivasha.

Disease

The ratio of raptors we receive with diseases picked up in nature is less than one to a hundred who have suffered trauma. This makes the usual preliminary investigation of haematology and serology almost superficial and an unnecessary delay process. However current attention to potential zoonotic disease transmission would indicate sensible precautionary approaches to birds that do not have obvious signs of trauma or poisoning. Take assurance in the fact that there has been no recorded case of raptor to human or raptor to livestock transmission in Africa. Handle a suspected diseased bird with a barrier such as a shirt or plastic bag over the hand and keep it separated from close contact with avian domestic stock.

10. Transport box & housing

The bird is best kept in a small dark warm box or kennel-like enclosure until its ailment has been determined and a larger shed cleared for it. The **cardboard box** is an easily found life-saver. It provides a dark and quiet place and is well insulated against heat loss. So long as the bird can stand up and turn around the box is sufficient. Towels placed on the bottom and 4x2cm square holes cut in the top quarter will allow enough ventilation. The problem comes with making sure the four flaps of the top are well secured and the best way to do this is to thread string through the flaps and tie it well.



Examples of individuals in the act of saving injured raptors placing them in a box prior to transportation. The commonly found cardboard box is a real life saver. NB the cloth placed around the Honey Buzzard and the careful and respectful placement of an Augur Buzzard in a box.

Birds that allow rescue are often near death and have lost their ability to thermoregulate (that is to keep their body temperature despite the outside temperature). It is therefore paramount that the box is placed indoors in a warm, dark and quiet location during the day and especially at night. Many people assume the bird would prefer being outside or they may feel it best for their own cleanliness to put it in an outside room or garage, but it really must be put inside and monitored. In cold highland locations place the box in the cooler part of an airing cupboard if available or next to the person who is tending it, in their room at night with a towel over the top. In cold environments with very sick patients a hot water bottle is needed. These can be easily made with standard glass bottles filled with warm water (not boiling! just above human blood temperature). Two can be placed either side of the bird to balance it, and are actually better than a standard rubber hot water bottle.

If the raptor is ill and quiet it can remain in its cardboard box for a maximum of 3 or 4 days so long as the towels are changed and it is kept clean and given oral water/food. Dry leaf litter and dry wood shavings can be padded down to form a cup in which the bird can rest and not roll on its side. Never use dry grass/hay, any damp material, sawdust or straw as this can be lethal because the bird may ingest pieces, or inhale fungus spores of *Aspergillus*. If the bird can stand an addition for the large box or kennel is a log placed centrally on the floor with a rubber car mat draped over it. This is easily removed and cleaned each day.

Do not place more than one raptor in a box unless they are very young siblings. In this case the siblings will get heat from one another and companionship vital for their survival.



Windfall siblings from nest, kept together for warmth and social imprinting.

11. Damage in captivity

About 50% of raptors brought in for rehabilitation suffer damage while in transit or in captivity. Depending upon their species, some 25% of these raptors suffer damage sufficient to cause their death unless treated. That some of these damaged birds have spent time in the care of vets without specific knowledge of raptors illustrates the fact that standard veterinary practice does not automatically imply good husbandry for raptors. If vets are involved, do inform them of the need for complete seclusion as we have seen raptors kept in cat boxes on the cold floor among dogs and cats that would have soon died of stress.

Inappropriate cages

Many rescued raptors are confined to parrot cages, chicken transport cages, open sided dog or cat boxes or cramped chicken coups and relentlessly smash their faces and flight feathers against the wire. Damaged ceres can lead to impaired growth of the bill with no hope for future release. Therefore any raptor with damage to bone cage sore requires 6 months management (out of the cage!) before its chances for release can be assessed. Similar cage damage to eyebrows, eyes, wing tips and flight feathers can be irreparable. Two fractured flight feathers on the same wing are enough to stop any chance of a heavily winged loaded fast pursuit raptor (**HWLFPR**) being able to hunt. It is no co-incidence that the **HWLFPR** species are the more nervous and sensitive species that are the more likely to get cage sores.



Lanner Falcon with severe damage to cere, splitting the bill and cutting into the bone. It was kept in a large open sided chicken wire cage with a blind jackal and a small crocodile at the orphanage encircled by public

viewing. The Black Sparrowhawk damaged its cere at a veterinary facility. It has been covered with antibiotic cream. The lanner did not fully recover 2 years after the injury, the Black Sparrowhawk grew flesh over the bridge of the nose in one month. These two raptors are Heavily wing loaded fast pursuit species and particularly prone to self mutilation in poorly designed enclosures.



Another example of potentially lethal cage confinement. In this case a carnivore capture cage, one of the most commonly used enclosures and one of the most destructive. The tips of the wings are damaged which in a matter of hours can permanently disable flight.

Travel Cat/Dog box

Large travel cat or dog boxes, as they stand, are not good for raptors because they have large holes and one open grill door through which the raptor will spend its entire time bashing against in an effort to get out. These boxes also lose a lot of heat and the bird will be able to see and hear stressful things. Boxes of about 2.5ft by 3 ft deep by 2ft high, or bigger, can only be used if these holes are completely covered, yet allow enough air to circulate. Sheets of cardboard can be cut and tied to the wire grill and sides on the **inside** to ensure that the raptor cannot hurt itself. A blanket can be spread over the box but this may still allow the raptor to bash against the grill and get hurt. We have provided some 20 custom made boxes for raptors situated across Kenya in our facilities.



A custom made temporary recovery box with a Steppe Buzzard. Note the vertical bars stopping the bird from attempting to get out. ½ inch chicken wire is 2.5cm away from the bars. The hawk cannot push its face against the chicken wire and cause cere damage. The artificial grass ledge is about 14cm from the base. The entire size is 90cm long by 61cm high by 58cm across. A towel is used to cover the window but removed later once the bird has got used to the situation. There is a LED light in each of these boxes. Small boxes such as these allow for minimal disturbance, recovery from trauma for small to medium sized raptors. They are deliberately meant to minimise movement.

Concrete floored kennels

On no account put the bird in a concrete cat box/ dog kennel or stainless steel cage with an open wire screened front, and hard concrete or flat steel floor. The use of these veterinary approved enclosures are inappropriate for raptors, are destructive and may rapidly lead to diseases.

These kennels and steel wash-down enclosures are potentially lethal in that they are highly stressful in allowing an outside view and they remove thermal heat from the patient. The wire or barred front will encourage the bird to try to escape. In its struggles it will break its feathers, open old wounds and destroy the cere, the soft part of the bill. The hard unforgiving surfaces will certainly lead to “bumblefoot”, a serious condition that will ultimately destroy one or both feet. Only two days on a flat hard cold surface can lead to a foot infection which is incurable without medical treatment, and should the bird be released in this state, it will surely die.

The large free flight enclosure

It is not likely that a person receiving a raptor has the facilities to build a special enclosure such as those at our centres. But here we show the investment and size required to properly cater to rehabilitating a raptor. Heavily wing loaded fast pursuit raptors are not expected to gain fitness levels in even large and expensive sheds and these are flown free using falconry techniques. Again this is outside the scope of this “how to rescue” chapter.



A rehab Tawny Eagle rests in a 6.5m by 6.5m by 3.5m high enclosure with natural-like features and ledges. We have some enclosures that are double this size and 4m high, but they do not provide enough space for vigorous exercise for heavily wing loaded fast pursuit raptors recovering from a wing injury.

12. First aid approach

There are three basic approaches depending upon the severity or the illness or injury. Stage One is a recently hurt bird, in otherwise good condition. Stage three is a very sick and dying bird.

Stage One

If the bird can stand, has good muscle mass on its sternum, defends itself vigorously, is aware of its surroundings and has a keen healthy open eye that tracks movement it may be able to eat on its own. Offer it (inside its box) a fist sized lump of red meat with absolutely no fat. Make sure the meat is room temperature, fresh and moist. Try to add as much water to the meat as possible. Do not soak the meat in water and remove the blood but put the meat into water and if possible inject the meat with water. Present the meat on a wooden board, tied down if necessary. Do not just throw the meat onto a soiled dusty floor. If it finds it difficult to eat, cut up the meat into pieces it can swallow. Retire completely and do not stress it by looking at it too much, the bird will only eat if left alone in complete silence. If it does not recognize the food, try dead day old chicks, a dead rabbit or pigeon or full carcasses of prey species it is familiar with. If a half day proceeds with no attempt to feed, the bird must force-fed (see Stage Two for procedure).

Stage Two

If the bird lies down, closes its eyes but recovers when it is disturbed, check to see just how much muscle mass it has on its sternum. Make sure you get water into the bird, either on its food, or down its throat with a small diameter pipe. If the chest is round and full, leave it with food as above, for half a day unless you are sure it will not eat on its own. If it has not fed you will need to force feed it. Make such that no roughage¹ of any kind is present in the food. Cut up the food into small grape sized pieces for medium to large birds, raisin sized pieces for smaller raptors. With blunt plastic tweezers take each piece and with an assistant open the bill and push each chunk down past the tracheal opening to the back of the throat. If it does not swallow, use your little finger or blunt ended pencil and push the food down to where you estimate the crop is.

¹ When a raptor is not able to create a cast from the roughage, this results in “sour crop”, a lethal condition in which the undigested mass of food and roughage goes rotten and does not allow food to be ingested.



Force feeding a Crowned Eagle. One person holds it, the other opens the mouth and pushes food down the throat.

Give $\frac{1}{4}$ of its daily rations once at 7am (making sure it is warm and not cold from the night), again at 11am, again 3pm and finally at 7pm. The total daily ration is 4% to 10% of its weight. Smaller species have a much bigger need for food than bigger species. A good estimate of total food requirement is the protrusion of the crop. Feel the crop with your hand. Owls do not have crops, so feel the stomach which is below the keel.

Look at the colour of the faeces. If the urates and the faeces are mixed and smell bad it may well have a gut infection. If they are consistently green it may indicate disease or starvation. As the food is ingested and past out the quality of the dropping should improve.

If the bird starts to throw up the food given to it, it is now in serious trouble. It is also in serious condition if it does not pass the contents of its crop into its stomach. This indicates that it has a “sour crop” and/or its guts are not functioning.

Stage Three

If the bird lies down, closes its eyes, does not react vigorously to handling and is generally depressed and inactive, force-feeding it may not recover the bird. It has probably lost a lot of muscle mass and its body is in the process of eating itself.

A starved bird is ingesting its own muscle and very little of its fat deposits. The muscle and fat is broken down into sugars and consumed as energy. The gut closes down and the enzymes used for digestion are not present and so food cannot be passed or used. In order to get the gut functioning again the bird needs to be rehydrated very quickly. It needs fluid replacement **before** food. Once re-hydrated these functions return slowly over the next few days. Usually the gut has bacterial infection requiring antibiotic therapy that in turn depresses the patient's ability to recover.

13. Providing Fluids

Fluid replacement is an essential part of treating sick raptors that may have not eaten or drunk for days. It is an essential first for starving, poisoned and trauma patients and those brought in suffering with any disease.

In poison cases fluids given orally serve three functions: 1) to induce regurgitation and clean out the crop and stomach. 2) to rehydrate the bird. 3) to force the gut to be mobile and excrete. The activation of the gut with fluids may push poisoned food into the gut and kill it, so make sure there is no food in the crop, proventriculus and stomach.

In patients that do not show tenting of the skin, dry mouths and sunken eyes, oral rehydration is advised. Patients with the above mentioned symptoms, and with a previous history that indicates dehydration, oral rehydration may fail in addressing the problem. In this case subcutaneous and, if critical, IV injections are required.

Oral rehydration

Oral rehydration is the placement of fluids down a rubber or plastic pipe taking care to miss the trachea which lies at the base of the tongue. (See image). Warm the fluid to blood temperature only if the ambient temperature is cold. If the bird is too hot, use cool water. Ask an assistant to open the bird's bill and place a pencil sized stick between the mandibles. Gently push the soft nosed rubber tube left or right and back of the trachea² opening to the back of the throat. Then (on a vulture or big eagle) continue to push it some 10cm to 15cm further on into the crop. Gently squeeze the fluid in.

² Air pipe opening lies at the base of the tongue



Oral volume may be regurgitated, sometimes persistently so, making the effort more stressful than the benefit. The fluids can enter the mouth and be breathed in leading to asphyxiation.

Sourcing pipes, syringes for providing oral fluids

In an emergency one has to improvise. Fuel pipes to a motorcycle carburetor, or from fuel tank to carburetor have been successfully used at many rescues. Fuel and small pressure hoses or windscreen wiper pipes in diesel and petrol cars have also been ripped out of cars (and replaced without any ill effect). The diameter for a vulture can be as much as 15mm (a water hose pipe), but ideally 5-7mm. Small hawks (like Kestrels and those below 400gm) should have 4mm tubes. Medium hawks like Augur Buzzards 5 to 7mm. If desperate for a tube cut a large bird feather, use a piece of bamboo or the tubes in a ball point pen. In the absence of a syringe fill your mouth with water and gently push the water down the tube into the bird's crop. Make sure the end of all tubes are smooth and will not cut the birds' throat. Use of a soft plastic squeezable bottle (such as an old IV bottle, baby bottle, or even a plastic soda bottle), can be fashioned to hold a pipe firmly. Push the tube past the trachea (the slit that opens and closes at the base of the tongue) and place the pipe tip till it reaches the crop at the base of the neck (or between the shoulders). We have provided feeding tubes (rubber catheter and plastic tubes) in our first aid kits now distributed widely in poisoning hotspots throughout Kenya.

Fluid replacement in poisoned vultures

In vultures 100-200 mls of water can be given in one go. Diluting Coke 50-50 with water has a greater than expected effect on retrieving sick vultures recovering from poisoning. Diluted soda/energy drinks for rehydrating animals is a traditional quick way to get sugars and salts into an animal when one has little

resources to hand. However coke seems to revive the bird shortly after giving it, suggesting that the famous erosive qualities may be actively at work in breaking down the poison.

Behaviourally vultures regurgitate when captured. It's a mechanism they use to distract carnivores if they get caught. In human hands they will regurgitate in the hope that the human would rather eat the vomit than the vulture! They will continue to vomit until you let them go. This is good with poisoned victims because they will reject the poison too.

One may find that the entire water volume and more is regurgitated. In these cases "washing out" the crop with water is removing poison and so it is good to continue until the regurgitated material is clean. However one must insure that the water does remain in the crop at some point and it may help to put the vulture in a dark secluded box alone so that it does not throw up. A good test to see if the water is passing through the bird is to see if it defecates with lots of fluid.

In critically ill near death poisoned victims the best policy is to give an IV-bolus and immediately place the vulture alone in a darkened box. Holding the head up and kneading the bag of fluids down into the stomach also helps for those incapable of passing the crop. Giving IV on vultures is relatively easy as the veins are as large as a human's, but this is obviously not advised if the rescuer is unfamiliar with IV injections.

Fluid replacement in other raptors

In other raptors suffering from trauma or dehydration the vet advice for oral route is to use glucose saline or 5% dextrose solutions given at 5% of the bird's body weight per day (4 to 8 times a day adding up to 5% body weight). In the field one may need to resort to the Coke/water or human rehydration fluid from a packet or water and glucose plus salt solution (one glass of water, one teaspoons of glucose, less than a quarter teaspoon of salt). Use a 10 to 20cc syringe and place a rubber catheter or any soft flexible rubber pipe (less than 8mm diameter).

14. Suitable and unsuitable food

Warning: if the bird is starving, do not **feed it**. It will not have the energy and fluids to digest the food.

Except for a very few, all raptors eat flesh and/or entire animals from insects, reptiles, birds to mammals. The biggest deciding factor in the provision of food is often not what the bird needs but what one can find and afford.

Types of suitable food

- Chickens- day old chicks, week old chickens, adult chicken heads
- Chicken giblets from commercial reared slaughtered chickens
- Ducks - day old duckling, week old ducklings, adult duck heads
- Domestic quail
- Domestic rabbits, rabbit heads from commercial farms
- Laboratory rats and mice
- Beef and or cow heads (especially suitable for large eagles and vultures)
- Butcher's meat (see remarks below)
- Fish

In first response members of the public will at most keep the bird for a few days. In this case they will only need to provide the bird with red fat free meat. This will either be beef or chicken giblets. Goat meat is not as palatable but goat heart is good (remove all fat). If kept for over 4 days, very lean red beef can be given to all raptors at a 50/50 ratio with a whole animal diet (day old chicks for example). Long term diets may differ.

Unsuitable meat

- Sheep and especially goats are often distasteful to raptors although vultures do not mind lean goat meat. Fat must be avoided as it is distasteful as well as able to cause gut infections, diarrhoea and lack of gut mobility. Fat can be fatal.

- Offal, the side product of slaughter houses, tripe etc. are distasteful to all but a vulture. Offal may include growths and tumours and literally be inedible. Offal from “cropping” or Problem Animal Control will contain lead and must never be fed to raptors (or anything else) unless certain that the bullet fragments are removed.
- Domestic pigeons which may carry with them the threat of disease such as TB or Newcastle’s Disease and while known healthy birds can be consumed by raptors they are to be avoided as a staple. If used they must be deep frozen then thawed.
- Guinea pigs may not be readily eaten by some birds. The smell of the Guinea pig gut content in particular is powerful and by the expression of distaste of the hawk or owl we suspect they are truly repugnant. It may be wise to de-gut Guinea pigs first therefore.
- Minced meat remains a serious killer of captive raptors in Kenya. Minced meat is nutritionally deficient, being made up of offal, fat and gristle, all of which is poorly digested by a raptor’s stomach. Even if consumed and digested the long-term effect is certainly a nutritional disease that will especially target bone development in young birds especially. The main issue with minced meat is the impossibility of the bird being able to pull at it and swallow it. Instead the mash remains on the tip of the bill and nothing gets swallowed.
- Never give a raptor an animal that has died of unknown causes.

15. How and when to give an injection

In an emergency a life may depend upon the need to give an injection. Every livestock owner knows how to do this. There are a few guidelines that make giving an injection safe. IntraMuscular (IM) injections are very easy to do and so are subcutaneous (SQ) injections. If one takes care not to push the needle into the body cavity or inject large volumes of irritant drugs, SQ injections are safe for those with limited veterinary training.

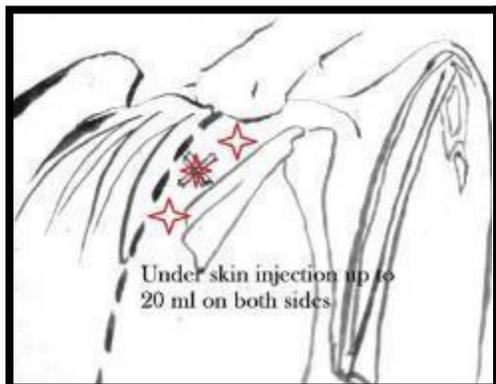
Intramuscular (IM) - for administering drugs

The rule for IM injections is to locate the largest and deepest muscle mass. On birds this is the pectoral or chest muscle. Another suitable site is the muscles both in front and behind the “drumstick”. The best needle is an insulin syringe as the needle is very fine. Failing that a 23-25 gauge needle with a length of 1.5cm on a 2ml-3ml syringe is preferred.

- Blow back the feathers and damp the feathers down with alcohol, hand sanitizer or clean water
- On a medium sized raptor and above push the needle 1cm in, close to but not on the keel and a quarter or half way down it. Angle the needle at 45 degrees to the surface and in any direction so that it doesn't touch the bony keel. On small raptors below 500g inject only 5 to 6mm deep. Tradition has it that before injecting, draw back on the plunger gently to see if blood enters the syringe. If it does, withdraw the needle a few mm and draw back again. If no blood is seen, inject. This is to avoid giving an IV injection.
- It is essential that the needle does not go past the muscle, through the bone plate on the chest and into the pleural cavity and inject the lungs, air sacs, liver or heart. This is near impossible to do on large raptors with a 1cm needle penetration.
- Take care to inject steadily and smoothly in as deep a muscle mass as possible. Do not inject at a very high rate. 3 second injections are ideal.

Subcutaneous (SQ) - for administering fluid and drugs

SQ injections can be given on the back between the shoulders, see illustration for sites on the back. The drugs and fluids can be mixed. While air bubbles are dangerous in IM and IV, they are not in subcutaneous injections, thus a lay person may be more comfortable in this technique.



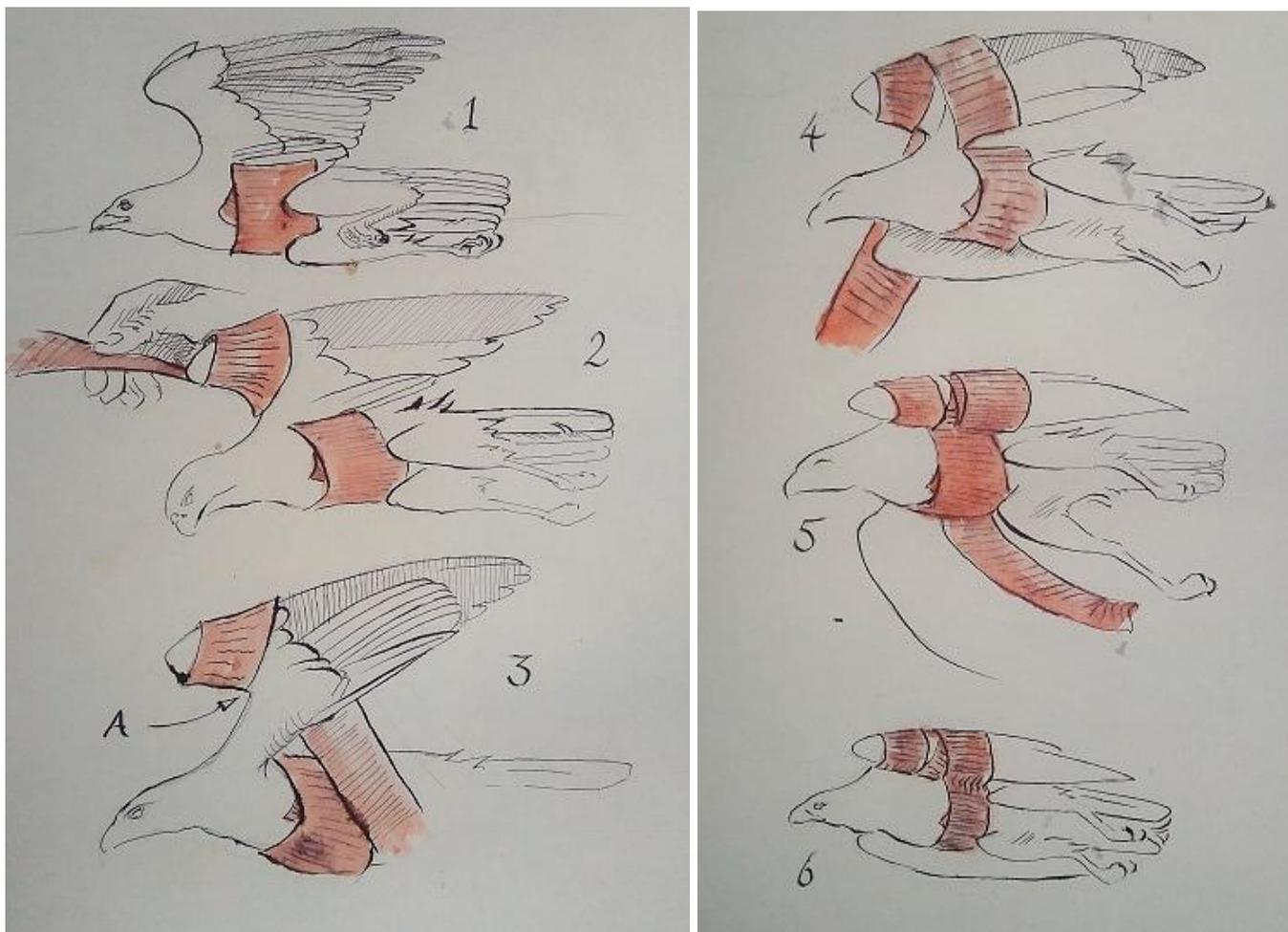
However if the bird is in acute near death dehydration, the chemistry does not allow fluid uptake from a subcutaneous site, and this may be judged by viewing the bag to see if it goes down within an hour. Take care to examine the bottom of the bird as gravity may pull the bag down to the lowest area. This may happen especially if the fluid is just saline. If uptake is static or very slow, treat this as an emergency and find someone qualified to give an IV injection.

- Damp down site (not vigorously as this can shock cool the bird), place needle under translucent skin as much as one cm, and slowly inject volume while watching the bag spread. If it gets too turgid too quickly, water may escape out of the needle hole site. Slow the rate and wait for the bag to deflate before proceeding. Keep the needle in for as much as 30 seconds before pulling it out.
- In an hour check to see if bags go down. And check too the underside of the bird to see if the fluid has gravitated to the lower sternum and not been taken up.
- Once the bird starts to defecate with high amounts of fluid one can be assured water is being taken up by the body.

Use lactated Ringer's Solution, mixed with the 5% Dextrose solution. If not available use sterile glucose (5% Dextrose and Sodium Chloride injection mixed 50/50). A large vulture can take a large bag of some 20mls on each side. Subcutaneous injections are painless and the easiest method that requires the minimum of training. In places where there is no injectable fluids, and one is certain that the bird has been without water for days, perhaps in the sun and severely overheated, as a last resort bottled water is effective as a subcutaneous injection, being relatively sterile and isotonic with about 20mg/litre of sodium. If there is time, take the precaution of boiling the water first in a sterile container and letting it cool to room temperature.

16. Bandaging a broken wing

Wing fractures are the commonest kind of injury found in raptors. If the bone protrudes through the flesh, clean it as quickly as possible, remove all dust/dirt and apply diluted dettol or other antiseptic or antibiotic ointment. Push the bone back into the wound, straighten out the limb and place the bandage as illustrated below. Make sure that none of the feathers are stuck using human sticky plaster bandage and also make sure that the blood supply is not constricted by the bandage.



The bandage will maintain a suitable position for transport to a centre. In the above illustration the primary body wrap (1) is done with a non-stick bandage. These illustrations are different to other methods using only vet wrap and assume that only masking tape or water soluble tape is available. The non-stick body wrap acts like a barrier and allows for easy removal.

“Vet wrap” is ideal but difficult to get. Use water-soluble brown packing tape if available to create a firm but non-constrictive wrapping. This tape can be used almost like papier mache and form a credible temporary cast if applied in multiple layers. The cast can be easily removed with warm water later. If all else fails the use of masking tape is useful. Although it will be very difficult to remove, it is better than nothing.



Left is masking tape and gummed tape. Middle is “gorilla tape”, which is totally unsuitable. On the right is a Black Sparrowhawk with gummed taped paper keeping the tail safe.

Pictured below is an extremely rare Ayres’s Hawk Eagle with the bandage as illustrated above, which was successfully treated for a broken wing, released and monitored to its nest, proving that rehab birds with fractured wings can return to the wild successfully.





NB top left notch cut in body wrap vet wrap to allow leg use. Top right. PUR glue (any glue) on vetwrap to form immovable contact.

Bottom left, packing to force proper alignment of primaries and carpal rotated inwards. Middle shows completed wrap and suture in bandage (not through skin!). Right another suture in bandages on mid back to ensure it does not become undone.



17. Common mistakes made by vets unfamiliar with raptors

Antibiotics overdose

Antibiotic therapy is essential for open wounds of course, but note that some veterinary surgeons may advise a one weekly injection of large doses. Such treatment is inappropriate and we have seen raptors killed outright by such treatment. Doses are usually given by oral, intramuscular or intravenous route 2 to 4 times a day at the calculated dosage rate for birds, not cats.

Treat and release

This Brown Snake Eagle appeared on a large social media platform and elicited pleas for its immediate release. Given it fell on a balcony immediate release would have been fatal. It was given to a vet who injected it and then let it go immediately. Evidently no one noticed that it had a damaged left eye and was probably blind and its too rapid release was lethal.



Laboratory tests

Various laboratory tests can be done with blood however we have seen vets attempt to take one quarter or more of the total blood volume of the bird. In view of the fact that there are very limited lab procedures available in Kenya, the value of basic blood work must be weighed against the trauma and expense of taking any volume of blood from a sick raptor.

Cytological samples and microbiological cultures have been taken and results beneficial in the past (1970-1980s) at Kabete, but since then we have had tardy and doubtful results of no benefit to diagnosis. This is a serious matter that needs to be addressed by the veterinary community.

For the purposes of this guide, the individuals involved in rescuing a raptor need not concern themselves bar from intercepting a possible presumed need to take samples for laboratory tests prior to implementing life restoring actions.

Wing clipping

We have also seen raptors having their feathers pulled out or wings “clipped” and while this may be a locally acceptable veterinary practice (though painful and cruel) for permanent domestic poultry who will never fly, it is a brutal and illegal practice for a wild raptor.



An example of a “clipped” wing. A common procedure by vets and those familiar with aviculture or zoo keeping. When this is done recovery may take years.

The water tray

The provision of a tray of water inside a box or shed for an injured or sick raptor is one of the most common mistakes. The bird will not recognise the water in a tray. It will not be able to stand in the tray and drink by scooping its bill into the water and raising its head to swallow it. It will of course spill the water and mess up the warm towel in the box which will now drop in temperature. Apart from not being able to achieve hydration it

represents a life threat due to hypothermia. It is recommended in most vet practices and in the SOPs of most wild animal protocols, but it must never be used.

Euthanasia

A decision to euthanize what is certain to be a permanent captive with a useless limb must depend heavily on the species. Rare, threatened and endangered raptors will of course take precedence over common raptors. If the threatened animal is alive and it can be argued that it is not suffering or in permanent pain (when euthanasia is legitimate), then it should be kept alive and submitted to a rehab centre for care with as much urgency as if it were a Black Rhino. Permanent cripples have formed the bases of captive breeding and education awareness programmes globally and especially so in Kenya. The issues regarding euthanasia are complex and are outside of the scope of this guide. If the raptor is alive, no matter what its condition or species, it should be rescued.

Conclusion

Even the most common raptors are in rapid decline in much of eastern Africa. Human attitudes are not conducive to opposing those factors that led to this decline such as poisoning, power lines and persecution. One of the only transformative experiences that brought about a positive change of attitude in Kenya has been raptor rehabilitation, which led to raptor research and raptor conservation initiatives. Those individuals involved in hands-on raptor care have had a wide impact among their own community. The relatively recent widespread poisoning of wildlife has seen many individuals from local communities, especially in the Mara Conservancies, actively get involved, despite inherent opposition, in saving vultures and eagles. Such an encouraging shift has given communities a sense of ownership and ability to play a part in protecting raptors.

Can raptor rehabilitation play a role in raptor conservation in Kenya? For the record it has been the only thing that has.