



Wild City Neighbours: a guide to native bird rehabilitation

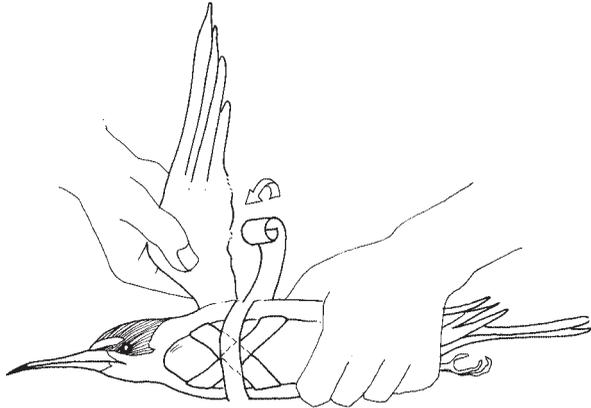
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Department of Conservation
Te Papa Atawhai

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Introduction

'Wild City Neighbours' is a Wellington-based network of volunteers who are involved in the rescue of marine mammals and native birds. It is a community initiative to help support people interested in this work and this guide will assist you, the volunteer, in the treatment and rehabilitation of injured birds.

A combined team of veterinary professionals, experienced volunteer bird handlers and Department of Conservation staff have gathered the information provided in this guide. Its objective is to provide an understanding of general principles of first aid, care and rehabilitation of birds. It does not include expert treatment that may be required by a veterinary professional.

Many references were used in the collation of this guide. These have not been quoted individually in the text, but have been listed in the bibliography.

The Department of Conservation's role

The Department of Conservation (DOC) is the government department responsible for the legal protection of most of New Zealand's wildlife. Protection ranges from absolute protection of most native bird, reptile and amphibian species (e.g. penguins, kereru) to partial protection (e.g. black shag) and game bird species (e.g. mallard duck, Canada goose). One native species (black-backed gull) and some introduced birds (e.g. finches, sparrows and blackbirds) are not protected.

A legal authority or permit is required to hold protected species in captivity, including rehabilitating injured birds

- This involves an inspection of facilities by DOC and an agreement by the holder to comply with certain permit conditions such as submitting an annual report on each bird held in captivity.
- Permits can extend for up to three years but generally only give authority for a person or institute to hold individual injured birds for up to three months. It is vital you apply for a new permit if your permit expires or you need to hold a bird for a longer period of time.
- Permits to hold injured wildlife of protected species temporarily in captivity do not extend to permanent confinement of birds that are unfit for release and are not required for a captive management programme.

Contact DOC immediately if you encounter a sick or injured bird of a protected or threatened species and you don't have a permit

to hold injured wildlife in captivity. You may phone your local office during work hours or 0800 36 24 68 at other times. In some instances, DOC may wish to transfer an injured bird of a threatened species to Massey University Veterinary Hospital for specialist care. Contact DOC even if the bird dies or has to be humanely killed because the body may be required for post mortem or other scientific and cultural uses.

DOC is the lead agency for the protection and management of New Zealand's wildlife. Here a rehabilitated juvenile wandering albatross (*Diomedea exulans*) is released.



BANDING OFFICE

Contact the Banding Office (address below) whenever you handle a banded bird. Band information is valuable for research and can provide useful information for the management of threatened species. The Banding Office will provide you with information that may be helpful for your rehabilitation efforts. If the bird is dead, remove and flatten the band and post this along with your information. Never remove the band from a living bird except in rare instances where band removal is required to allow healing of a lower leg or foot injury.

Record the following band information:

- band number
- species
- age class and sex (if known)
- location found (grid references if possible)
- circumstances
- cause of death (if found dead and the cause is obvious)
- outcome (e.g. released immediately, released after being held captive, died or humanely killed)
- your name and contact details
- colour band combination (left leg top-bottom, right leg top-bottom)

Send band information to:

New Zealand National Banding Scheme
Department of Conservation
PO Box 10420
Wellington.

Other agencies involved with wildlife rehabilitation

IWI

Many of the species that are brought to a rehabilitation unit are tāonga to Māori and tangata whenua are the kaitiaki, or guardians, for the species. While Māori value a number of these species' feathers for weaving and their bone for carving, the relationship also involves obligations of the kaitiaki to conserve the tāonga and their habitats. The Department of Conservation has a role in assisting tangata whenua to maintain that relationship while continuing to meet its statutory obligations.

WILDLIFE REHABILITATION VOLUNTEERS

Some individuals or institutions are given authority by DOC to temporarily hold injured wildlife. Wellington Conservancy of DOC has a contact list of volunteers, the 'Wild City Neighbours', and can direct people with injured birds to someone in their area (if you are not a permit holder yourself). These people generally have a strong interest in protected species and have the necessary skills to care for and treat injured wildlife.

VETERINARIANS

Some vets are willing to provide a certain amount of care for free; others will require payment so it is essential that you determine this before using the vet's services. Be aware that DOC will only pay for vet bills for highly threatened species and you must arrange payments with DOC before committing to vet care.

Consult a vet immediately if:

- There is a possibility of fractures.
- There are signs of internal injuries.
- Medication is needed.
- The bird is obviously sick and not responding to supportive treatment.

REGIONAL COUNCIL

Contact the Harbour Master at your Regional Council if you find a bird that is the victim of an oil spill. This is important for two reasons.

- Your find may be the first evidence of a spill. The earlier a spill is detected, the greater the chance of identifying the polluter and recovering cleanup costs.
- The Harbour Master will put you in touch with local people who have been trained to treat and rehabilitate oiled wildlife.

SOCIETIES FOR THE PREVENTION OF CRUELTY TO ANIMALS

Check with your local SPCA to inquire if they have a vet working for them and if they are willing to treat wild birds. Wellington SPCA is prepared to receive any wild bird that requires veterinary attention but they are not able to house or rehabilitate birds for long periods.

Wildlife rehabilitation aims and principles

The ultimate aim of wildlife rehabilitation is to treat and rehabilitate sick or injured individuals so that they can be released and live on as healthy members of wild populations.

- The successful treatment and release of individuals of a rare or locally rare species can benefit the population and you may contribute to the conservation of the species as a whole.
- In the case of common species, the survival of one individual will not make a significant difference to the population but you have the satisfaction of having provided obvious benefits to the individual's welfare.
- People involved in wildlife rehabilitation have an important responsibility to minimise the risks of spreading diseases from birds in their care to wild populations (see 'Disease control in wild birds').

It is important not to have unrealistic expectations.

- You are likely to lose more birds than you save. You can derive some consolation from knowing that, at the very least, you are helping to relieve pain and suffering of individual birds. You may also develop skills and techniques potentially useful for management of threatened species.
- Be realistic about individuals you attempt to rehabilitate. Early identification and prompt euthanasia of 'hopeless cases' is preferable to the 'wait and see' approach because these birds are likely to be in pain and severely stressed by captivity. Conversely, birds with fractured limbs have been denied the opportunity of full rehabilitation and release because their well-meaning finders kept them for a week or two before seeking proper treatment. Seek advice early if you lack experience with a particular species or are unsure about what to do.

Some other important principles of wildlife rehabilitation:

- Avoid the taming or mal-imprinting of young birds. Habituation to people and pets will reduce a wild bird's chance of survival after release.
- Minimise the time each bird is held in captivity.
- Do not release a bird unless you have cause to believe it has a reasonable chance of survival in the wild. Make sure it is fully recovered from illness or injury and has suitable habitat, adequate food source availability and safe environmental conditions.
- Never release a bird at a place and time where its species or subspecies does not naturally occur. Ask DOC if you are unsure.

Human safety

Protect yourself from injury or disease when catching or handling birds.

- Wash hands thoroughly before and after handling an animal.
- Wear gloves and a face mask if you suspect a bird is diseased or contaminated.
- Wear protective clothing and clean with disinfectant (e.g. nappy cleaner) after use.
- Wear safety glasses. Many birds use their beak as defence and can cause serious eye injury. Hold birds at a safe distance from your face and gain control of their head as soon as possible after capture.
- Thoroughly wash and disinfect any scratches or wounds received from a bird.

Examples of 'zoonoses' (diseases carried by animals that are infectious to people):

- *Campylobacter*, *Salmonella* and *Yersinia* are bacteria commonly shed in the droppings of infected birds that may appear healthy. Symptoms in people include diarrhoea, fever and abdominal cramps.
- Psittacosis is especially common among psittacines (budgies, parrots etc.). Infection of humans is through inhalation of bacteria and symptoms can range from flu-like symptoms to pneumonia and death.
- High levels of *Cryptococcus neoformans* yeast can occur under pigeon roosts and can cause pneumonia in people who have inhaled spores.

Record keeping

It's vital you keep good records of what you do. This will assist you with future rehabilitation efforts and will improve our general understanding of the species. Accurate record keeping will also assist in comparing treatments and will help ensure that we use the most humane and successful methods. Sharing of information can help develop better treatment and husbandry methods with improved outcomes for future casualties. You will need to record the treatment and outcome of each case as part of your annual report to DOC.

Request and record the following information from the finder of an injured bird:

- Where and when was the bird found? Include location (e.g. Days Bay) and situation (e.g. hit by a car or brought in by a cat).
- What was the bird doing when found?
- When and how was it captured?
- Since capture, how was it housed, fed and treated before coming to you?
- Were there any obvious hazards or toxins in the area where the bird was found?
- Ask about recent weather conditions, especially any storm events.

Details to record:

- Species (if unsure, classify as far as you can until confirmation can be made by an expert).
- Age class (e.g. chick, fledgling, sub-adult, adult, unknown).
- Sex (in some species identification may be difficult as both sexes may look similar).
- Any obvious injuries or symptoms such as weakness or paralysis.
- Any band numbers or other identification.

Record captive treatment data:

- Any further diagnostics (x-rays, disease screening etc.), treatments and medication, including details such as quantity, concentration and frequency.
- Types, amounts and frequency of food and feeding methods.
- Body weight at regular intervals and prior to release.

Initial response to finding a sick/injured bird

Before disturbing a bird that appears sick or injured, observe the bird from a distance and take time to assess whether it is actually sick or is simply resting. You are more likely to correctly diagnose abnormal behaviour when the bird does not feel threatened. Once aware of your presence, most birds will try to mask their symptoms.

A healthy bird will be bright and alert. The bird's breathing will appear barely perceptible and its body sleek with good plumage condition. Be aware that a healthy moulting bird may look scruffy and miserable to us. Also, many healthy large seabirds are unable to take flight on a flat site and/or without the aid of wind. Check for bilateral symmetry. Both sides should look and move similarly. There should be no sign of trauma, swelling, lameness, abnormal posture or wing carriage. Systematically observe each part of the bird's body from a distance, starting from the head and working towards the tail so as not to miss any subtle abnormalities.

A sick bird may be exhibiting symptoms such as:

- Damaged, ruffled or dirty plumage (see note on moulting birds above).
- Hunched stance or fluffed-up feathers.
- Tail bobbing, laboured or open-mouthed breathing which may suggest the bird has respiratory problems.
- Eyes partially closed, frequent blinking or head under wing.
- Yawning.
- Reduced responsiveness, problems with balance, coordination, orientation or consciousness.
- Use of bill, tarsi or wings for support when sitting on the ground.
- Wing droop, lameness, bleeding or other signs of trauma.

Observe the bird from a distance:

Is it sick or injured?

- Is the injury already healed?
 - Do not touch (unless bird appears in poor condition and unable to survive without intervention).
- Is there an obvious injury or problem interfering with the bird's ability to feed or move normally?
 - Capture to assess whether the bird needs treatment (in the field or temporarily in captivity).

Is it resting, moulting or recently fledged?

- Do not touch (unless it is in danger of predation or harassment).

This broad-billed prion
(*Pachyptila vittata*)
shows the typical 'sick
bird look' which
includes fluffed-up
feathers and hunched
stance.



Capture and handling

To minimise stress when capturing or handling wild birds, work with a skilled handler or gain experience handling healthy domestic birds such as chickens or budgies. Don't forget your own safety—birds have sharp bills and claws and have no respect for the care you are offering them (see 'Human safety' section).

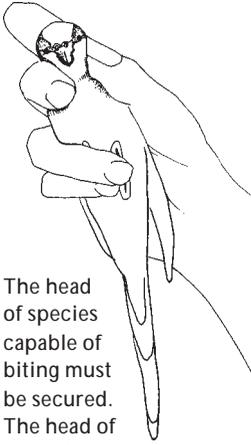
CAPTURE TECHNIQUES

Ideally, work in teams of two or more when planning any capture of an injured bird. Move quietly and calmly at all times and be careful not to exacerbate any existing injuries. Be particularly careful to avoid damaging the delicate bones of long-legged birds such as waders.

Plan your approach during initial capture (and in subsequent handling of the bird in captivity) to achieve maximum safety and minimum stress to both handler and bird. Attempt to drive the bird into a corner or barrier if possible. Take special care to prevent an injured aquatic bird from escaping into the water during the capture attempt. Approach the bird with an outstretched towel. This will confuse the bird, increase your effective catching area and protect you from the beak and claws of a large aggressive bird. A large bird is best caught by gently throwing a towel over the whole bird then using the towel to wrap around the bird's body to restrain its wings. Smaller birds can be caught and restrained using only your hands. Wing restraint is important because a flapping bird is likely to further injure itself.

A net can be useful in capturing wild animals. Try to enlist help and work as a team of drivers and a catcher. Drive the bird towards the net and gently scoop the bird into it. Avoid using the net in a swatting motion as this can cause serious injury to the animal.

HANDLING TECHNIQUES

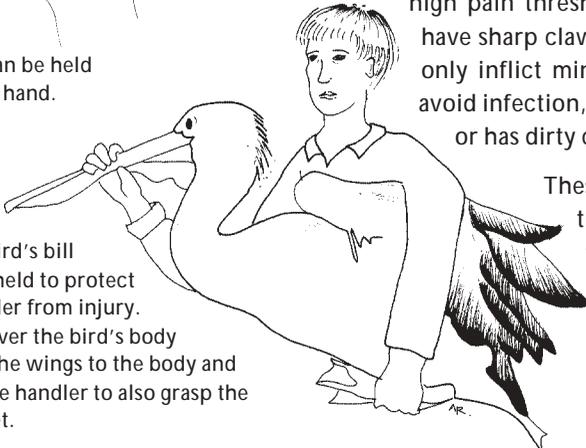


The head of species capable of biting must be secured. The head of this kakariki is being firmly but carefully held.



A pipit can be held with one hand.

A large bird's bill must be held to protect the handler from injury. An arm over the bird's body secures the wings to the body and allows the handler to also grasp the bird's feet.



Never handle any wild animal more than is necessary. If you must talk, do so in a quiet tone of voice. Birds are prone to capture stress. Be especially careful when handling small birds as they are very delicate. Do not stroke birds and try to avoid contacting any bird with hands that are wet or contaminated with nicotine, oils or other substances. Even clean dry hands will remove oil from feathers and contaminate them.

Hold the bird gently and firmly enough to prevent struggling and escape but be very careful not to restrict its breathing in any way. Take care not to limit movements of the bird's abdomen or keel (the bird must move its keel downwards to breathe). Do not block the bird's nostrils. Never tape a bird's beak closed as this compromises breathing, increases stress and can lead to death if the bird escapes or regurgitates and inhales its stomach contents. Gannets and shags do not have external nostrils on the beak and so cannot breathe at all if their beaks are held closed. When handling any large or aggressive bird, keep it at a safe distance from your face. Gain control of the head rapidly but gently and firmly grasp the back of its head with 2 or 3 fingers (see diagrams).

Take care when capturing and holding raptors and avoid being grasped by their talons. If you are unfortunate enough to be caught in the vice-like grip of a raptor, use your free hand to first extend the hind claw then follow with the other claws. If both hands are caught, you'll need some help (or a lot of patience and a high pain threshold!). Many other species have sharp claws. Although they generally only inflict minor scratches, take care to avoid infection, especially if the bird is sick or has dirty claws.

These diagrams demonstrate the best handling methods for large and small species.

Examining and treating sick and injured birds

Once in the hand, you can examine a sick or injured bird to assess whether it should be taken into captivity for care. Check the bird in a systematic way, starting at the head and working down the body to the tail and feet.

Use the following checklist and Appendix 1 and 2, all adapted from Lee (2000), for your assessments in the field and at the rehabilitation centre or vet clinic. Note that it is seldom necessary or practical to carry out a full assessment in the field. Keep the initial assessment as brief as possible. Attempt only what you can achieve confidently and quickly, focusing on those aspects of assessment and treatment that are needed to decide whether the bird should be removed from the wild and to enhance its welfare and survival during transport. The bird is probably in shock so it is important to avoid any unnecessary handling at this stage. Delay a more detailed examination until after the bird is stabilised at a place set aside for rehabilitation (see page 27).

Check for:

- Cuts, bruising, bleeding, infection, lumps or other skin lesions, scars, missing or damaged feathers, lice, ticks and mites (see Appendix 4: Checking for external parasites). Cuts involving damage to deeper tissues may need prompt surgical repair by your vet; e.g. ruptured crop. Note that some 'lumps' may be normal conditions; e.g. subcutaneous emphysema (pockets of air under the skin) in a diving bird such as a gannet and fullness of crop (in birds that have a crop).
- Damage to the mandibles. Test that they open and close normally. The bird should resist you opening its beak; lack of jaw tone indicates weakness.
- Discharges, bubbles, fluid or feather staining around the nostrils, asymmetry or blockage of the nostrils or crusting and thickening of the cere or eyelids.
- Eye discharges and swelling of the conjunctivae (tissues inside the eyelids) or the skin between the bird's eye and nostril.

- Uneven pupils. This indicates head injury whereas normal pupils should be equal in size and irises should look similar and of normal colour and texture for the species.
- Eye damage including bleeding within the eye. This is often associated with other signs of head trauma.
- Discharges from or foreign material (e.g. ticks) in the bird's ear holes.

Examine a bird systematically checking mandibles, eyes, nostrils, ears and mouth. Arrow indicates approximate position of external ear opening (hidden by feathers).



Check for injury, swelling and bands. Record your findings carefully.



This bird's keel is very prominent, indicating poor body condition.



Palpate wings to check for fractures or other injury; injury is often more easily seen from the underside. Note any missing or damaged feathers.



Check the cloaca is not distended or caked with droppings. The mucous membrane should be moist and pink. Also look for lice eggs at the base of the feather shaft. When dealing with sick birds take the precaution of wearing gloves.



- Erosions, red spots, raised whitish plaques or other lesions inside the mouth. The bird's mucous membranes lining the mouth cavity should be pink and moist although its tongue should be dry. A pale mucous membrane may indicate blood loss, anaemia or shock.
- Discharges from the roof of the mouth or glottis (entrance to the airway).
- Foreign bodies such as fishing hooks or fishing line in the mouth or throat (look for fishing line caught around the base of the tongue in case a hook has already been swallowed and the line broken).
- Signs of brain damage (e.g. seizures, head tilt, loss of balance, abnormal movements or poor coordination). A bird with these symptoms but no obvious head trauma may be suffering from the effects of toxins (e.g. botulism, lead poisoning), malnutrition, shock, dehydration, hypoglycaemia or a combination of factors.
- Laboured breathing (e.g. with open-mouth, wheezing, exaggerated abdominal movements, tail bobbing, glottis opening and closing unevenly).
- Poor body condition. In a healthy bird, you should be able to feel a convex muscle mass (pectorals) on either side of a central bony ridge (keel). The keel should not be prominent. A 'sharp keel' indicates wasting of the pectoral muscles and poor condition. To assess a seabird's condition, it is necessary to work your fingers through the thick layer of insulating feathers.
- A distended abdomen. This may indicate fluid accumulation. A normal bird has a flat or slightly concave abdomen.
- Soiled feathers, especially around the cloaca. Check that the cloaca is not impacted with droppings pasted over the vent.
- Dehydration. Briefly press your finger on the bird's ulnar vein, which runs across the under-surface of the elbow. If it takes more than half a second to fill with blood again, this may indicate dehydration, low blood volume or low blood protein levels. Severely dehydrated birds may also have sunken dry eyes and wrinkled skin. Sick birds are likely to be at least 5% dehydrated before developing any of these signs.

- Fractures and internal injuries. Carefully palpate wings and legs for fractures, starting close to the body and working outwards. Gently check for any swellings, bruising (greenish discolouration), deformity, grating, instability, reduced range of movement and muscle wasting.
- Wing injury. Bruising of the wings is generally more easily seen on the underside. If there are no signs of damage, check for normal and symmetrical wing movement by allowing the bird to stretch its wings while you continue to hold its body at arm's length and then lower the bird to encourage wing flapping.
- Leg injury. Check whether the bird can grasp with its feet and push or withdraw the legs normally. A weak grip or reduced withdrawal can indicate general weakness or more specific nerve damage.
- Hypothermia or hyperthermia. Are the extremities (e.g. feet) warm or cold? A hypothermic bird may look weak, fluffed-up and have wet skin because of damaged or soiled feathers. A hyperthermic bird may be panting and holding the wings away from the body.

In some instances, you can give simple first aid and then immediately release the bird. Examples of these situations occur after disentanglement from litter (e.g. plastic or nylon) or after removal of a fish hook from a bird's beak. It is important to make sure there are no other complications (e.g. evidence of a swallowed fishing line, dehydration, emaciation, or exhaustion) that may prevent the bird from recovering on its own.

Contact the rehabilitation centre or vet before bringing in the injured bird if you determine that care and treatment in captivity is required. A detailed description of the bird's condition and/or injuries will allow for appropriate preparations before the bird arrives.

PREPARATION FOR TRANSPORT

Try to provide temporary support to unstable wing fractures before moving the bird any distance. This will minimise further pain, soft tissue damage and contamination. Be aware that frightened birds are likely to stand on their broken wings.

- Apply a figure eight bandage (see illustration below) to reduce movement of radius/ulna fractures or other fractures below the elbow.
- Apply a wing-body bandage (see illustration on opposite page) to give temporary protection to fractures of the humerus. Take care that the bandage encircling the bird's body in front of its legs and behind its good wing is sufficiently loose to allow the bird unrestricted breathing.
- Wrap broken toes in a ball bandage.
- Support leg fractures below the stifle (knee) with a padded bandage.
- A leg-body wrap may help to provide temporary support to a fractured femur.

Never use sticky bandages or ointments as they are difficult to remove and cause too much damage to feathers and skin. Thin papery Micropore® bandages are excellent for holding padded splints onto legs and stretchy bandages like Co-Flex®, which stick only to themselves, are good for bandaging wings.

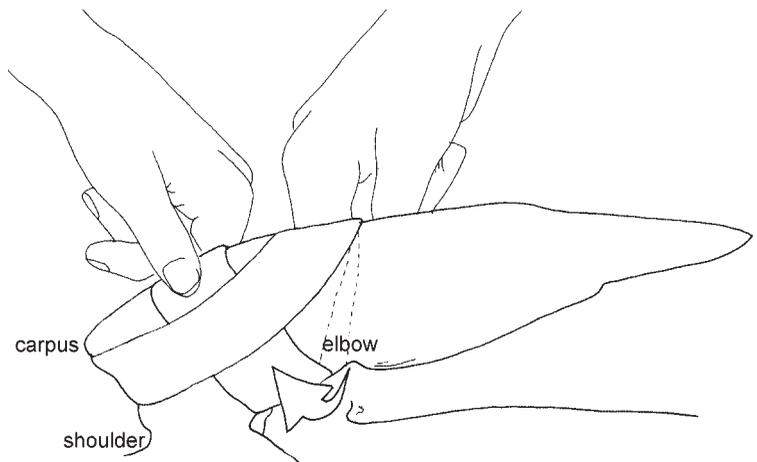
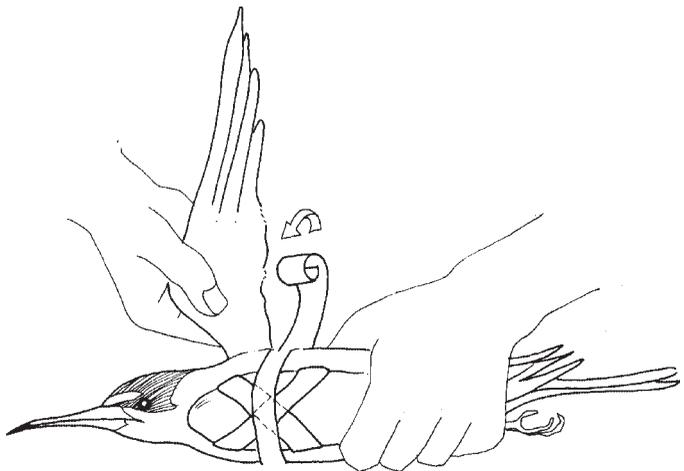


Figure eight bandages are used for wing fractures below the elbow.

WHAT TO DO WITH DEAD BIRDS

Legally the Crown holds responsibility for all protected species whether they are alive or dead. It is illegal to keep dead birds unless you hold a permit that allows you to have protected species in your possession. Dead birds should never be discarded or buried without first checking with DOC. A number of important uses can be made of the dead body: feathers and bone for cultural purposes; whole bodies, skins, and skeletons for museum collections; post mortems to identify causes of death; and tissue/ blood samples for research on the species.

Wing-body bandages are used for fractures above the elbow. Start a figure eight bandage to the wing then encircle the body, allowing enough room to ensure the bird can still breathe.



Transport

CONTAINER HYGIENE AND DIMENSIONS



A cardboard box or pet-carry box is adequate for species such as this teal (*Anas aucklandica*).

Sturdier boxes may be needed for species that can damage cardboard, e.g. kaka.

Use transport containers that are disposable or that can be thoroughly cleaned and sanitised after each occupant to ensure there is no disease transmission between individuals. Make sure containers have adequate ventilation. Avoid wire meshed cages as they can damage feathers. Large birds, such as albatrosses or giant petrels, may be held wrapped in a cloth or towel to restrain their wings or placed in a suitably large container such as a cardboard box. Ensure all containers are sufficiently robust and securely closed to prevent a bird's escape.

The box dimensions must allow the bird to stand up, extend its head and provide sufficient head-to-tail length. It is neither necessary nor desirable for the bird to be able to fully extend its wings during transport. Boxes that are too large allow the bird to flap about and potentially injure itself further. Do not put more than one bird in each box or compartment.

You can use a padded, non-slip surface, such as several layers of towels (check that there are no frayed edges to entangle the bird) on top of rubber matting or closed-cell foam to line the bottom of the container. This is especially recommended for seabirds. Some land birds will appreciate a perch. Fasten any perch securely so it cannot injure or entrap the bird. Make sure the box interior has no sharp edges or protrusions.

CONTAINER ENVIRONMENT

In most cases, an ambient temperature of 25–27°C will suffice during transport. Temperatures can be cooler for a bird that appears to be overheated, warmer for a chilled bird. Birds should be monitored during transport for signs of heat stress such as panting and holding the wings away from the body.

The transport environment should be quiet and dark. Turn the car radio off, avoid loud noises and keep conversation to a minimum. Cover the container with a visual barrier that does not impede ventilation if the cage design allows the bird to see too much of its surroundings.

Treatment at the rehabilitation unit

DISEASE CONTROL IN WILD BIRDS

A rehabilitation unit can be as simple as a small aviary or cage set aside for rehabilitation. Aviaries and cages can harbour and encourage the spread of diseases. Minimise the risks of exposing captive birds to diseases they are unlikely to have encountered in the wild. A diseased individual bird can infect an entire wild population when it is released. Disease control depends on strict attention to hygiene. Restrictive and overcrowded facilities raise disease control issues and reduce the bird's quality of life. Note that infected birds do not necessarily look sick. Injured birds that enter captivity with 'normal' parasite burdens, or that are 'asymptomatic carriers' of viral or bacterial diseases, can succumb to these pre-existing infections when stressed by captivity.

Minimise the spread of disease by adhering to the following:

- Put only one bird or cohort (group of birds from the same area entering captivity at the same time) in each enclosure.
- Avoid housing birds of different species together.
- Apply an 'all-in, all-out' system—don't house a succession of short-stay patients in an aviary occupied by a long-term patient.
- Clean and disinfect all food and water containers, utensils and perches before their re-use by another bird.
- Thoroughly clean and disinfect all cages and, where possible, aviaries between occupants. Select cages and aviaries with designs that can be effectively cleaned and disinfected.
- Any cardboard boxes used as temporary enclosures should be utilised by one bird only and then burnt.
- Develop protocols to screen incoming birds for parasites and diseases so that infected birds can be treated. Repeat this process prior to each bird's release. (Ask your vet or contact other members of the Wild City Neighbours network for suggestions.)

MINIMISING STRESS AT THE REHABILITATION UNIT

Disturbances such as handling can cause shock or stress for even seemingly aggressive and robust birds. Signs of severe stress include shivering, panting or open-mouth breathing. In extreme cases the bird may 'faint'. If this happens, immediately stop all handling and return the bird to a dark enclosure to recover. Both stress and shock can weaken the immune system so that the bird becomes more susceptible to disease. A stressed bird may also undergo significant weight loss and delayed wound healing. While it is essential to minimise stress and pain, periodic handling of birds is often necessary. Discuss pain and stress relief options with your vet if you are rehabilitating birds on a regular basis.

To reduce stress in a captive environment:

- Keep sick birds in a quiet room with subdued lighting.
- Use an area that does not need to be entered for other reasons so that the bird is disturbed minimally.
- Minimise visitors and keep any pets out.
- Carry out any housekeeping duties that are required (e.g. replacement and replenishment of dirty food and water containers, floor linings etc.) when you remove the bird from its enclosure for feeding or treatment, rather than disturbing it again later for these tasks.

When recapturing a bird from its enclosure:

- Plan what you need to do before entering.
- Choose a time when the bird will be easiest to catch (e.g. when the bird is asleep).
- Ensure you have the necessary equipment and people to help. An assistant is generally needed when feeding, medicating or examining larger birds.
- Consider restricting the bird to a small aviary or box in cases where the bird needs to be caught regularly. The benefits of freedom in a large aviary may be offset by the stress caused by repeatedly capturing the bird.

EUTHANASIA

The decision of whether a critically ill bird should be subjected to intensive care will depend on the individual case. You need to consider whether the bird has a realistic chance of recovering fully from its injuries once shock and dehydration have been overcome.

If a bird has significant feather damage, consider:

- How long it will take to grow replacement feathers. Ask experienced ornithologists for information on the time it takes specific species to grow replacement feathers and about moult patterns.
- Can the bird tolerate captivity for that long and will conditions be suitable at release time? (This is especially important for migratory species that may have left the area).

If you know or suspect the bird belongs to a rare or threatened species, you should always contact DOC for advice on what to do. A mildly disabled bird of a threatened species might, in some cases, have a useful role in captivity but you should never assume this. Possible outcomes for a bird that won't make a full recovery in the wild must be investigated early in the rehabilitation process. If, as is more likely to be the case, the bird belongs to a species not required for a captive programme, its options are probably limited to full recovery or euthanasia. If you anticipate holding the bird in captivity for longer than three months, you need to discuss permit options with DOC.

You should resist any temptation to permanently keep crippled wild birds in your back yard. As a rehabilitator, you need to examine a bird's quality of life when considering permanently housing a wild bird. You are not allowed to permanently hold injured protected species that are unfit for release and are not required for a captive management programme. As well as breaching their permit conditions, permit holders who cannot allow euthanasia of such birds tend to run out of resources to care for future casualties that do have potential for full recovery and release.

Everyone will agree that euthanasia is an unpleasant job but there are occasions when it is obvious, even to an untrained person, that this is the most humane thing to do. A bird deemed hopelessly injured or terminally sick should be killed humanely and quickly. If you do not have sufficient training or experience in humanely killing birds you must take the bird to your local vet or other suitably trained person. Under the Animal Welfare Act 1999, vets are required to humanely kill 'a severely sick or injured animal (other than a marine mammal)' (if), 'in his or her opinion, the animal should be destroyed because reasonable treatment will not be sufficient to make the animal respond and the animal will suffer unreasonable or unnecessary pain or distress if it continues to live'. You should not be charged for this service.

ADMISSION AND INITIAL CARE

It is important that details listed in the 'Record keeping' section, name and contact details of the finder and any additional information is transferred with the bird. The caregiver may wish to ask further questions and the finder is likely to be interested in the bird's progress.

It is a good idea to allow the bird some recovery time in a warm, well ventilated and dark area when the bird first arrives at the rehabilitation centre and before further handling. At times experienced rehabilitators may see fit to administer the first dose of fluid therapy (see below) to selected cases at this stage. Aim for 28–30°C with 70% humidity but monitor for signs of heat stress. It is vital to maintain adequate humidity; e.g. warm the area with a fan heater blowing over an open container of water outside the bird's enclosure.

After ensuring the bird is warm and settled, carry out or repeat an assessment of the bird's condition (see 'Examining sick and injured birds' and Appendix 1 and 2) and decide whether the bird can be cared for at the rehabilitation unit or needs to be transferred to a vet clinic or humanely killed. For very sick or dehydrated birds, ongoing fluid replacement will take precedence over further diagnostics (e.g. blood tests, x-rays) or treatments (e.g. changing bandages, parasite control) that will cause the bird further stress.

Birds brought to you because of an acute problem may also have healed injuries such as crookedly healed fractures. It is important to assess how well the bird has been coping with its chronic disability before deciding whether to proceed with treatment of the new problem or to humanely kill the bird. Assessment of the bird's body condition and muscle tone in the affected limb, in combination with the nature of the bird's injuries, can sometimes help you make this decision.

It is strongly recommended that you provide some level of disease screening and this must be done while the bird is still effectively in isolation and definitely before it is moved into an outside aviary (since outside aviaries cannot generally be properly disinfected). The extent of disease screening will depend on your budget and access to someone prepared to collect and examine samples or submit them to a lab. Collection of droppings can be done at any time but more stressful procedures such as cloacal swabs, are best delayed until the bird is rehydrated and stabilised.

The aim of screening and treating infected birds is not to eliminate all parasites or pathogens but rather to control their numbers while the bird is held in captivity and to minimise risk of passing pathogens to other birds in your facility or to wild populations upon release. Parasite numbers can quickly increase to levels that are debilitating to birds kept in confinement. Not all bird species will require parasite control as a standard treatment regime. Some parasite treatments have a low safety margin for sick birds so try to delay any parasite treatments until birds are stabilised and rehydrated. Discuss guidelines for parasite treatment with your vet.

FLUID REPLACEMENT

It is safe to assume that most sick birds will be at least 5% dehydrated.

Signs of more severe dehydration include:

- Dry mucous membranes.
- Dry, sunken eyes.
- Wrinkled skin.

- Delayed filling of the ulnar vein (see 'Examining sick and injured birds').

Never try to give oral fluids or food to a bird that is cold, lying on its side, regurgitating or semi-conscious. A dehydrated bird that remains extremely weak and/or fails to regain normal body temperature after being placed in a warm, quiet environment will not be able to efficiently absorb fluids or nutrients through the gut. It is likely to regurgitate and inhale any fluids given by mouth. Such cases will require veterinary treatment.

A sick, anorexic bird that is strong enough to hold its head up can usually cope with tube feeding. Tube feeding (gavage) is an invaluable technique for getting fluids and nutrients into sick birds. It involves placing fluids or a liquidised food directly into the bird's crop, oesophagus or stomach via a crop needle (see photo) or stomach tube. If you wish to learn how to tube-feed a bird, please contact the Wild City Neighbours Network coordinator at DOC's Wellington Conservancy office to arrange a training session. Instructions are not provided in this guide because tube feeding is a potentially dangerous technique that should be practiced initially under the supervision of a trained person. If you already know how to safely tube feed a bird, here are some guidelines on how much and what type of fluids and nutrients to administer (from Gartrell 2002).

Guidelines for tube feeding



Plastic feeding tube attached to syringe ready to draw up electrolyte solution.

- Aim to give c. 15 ml of warmed (c. 35°C) electrolyte solution per 100 g of the bird's bodyweight per day for the first couple of days or until it is eating well by itself. This volume provides the bird's estimated maintenance fluid requirements and allows for correction of initial dehydration.
- The total daily fluid volume needs to be divided into at least 3 or 4 portions throughout the day.
- You may be able to give up to 5 ml per 100 g per session to most birds smaller than 500 g; 4 ml per 100 g is more realistic for birds weighing 500 g or more.
- Always watch for fluid welling into the back of the pharynx; if this happens, immediately stop, suck back a little fluid, release

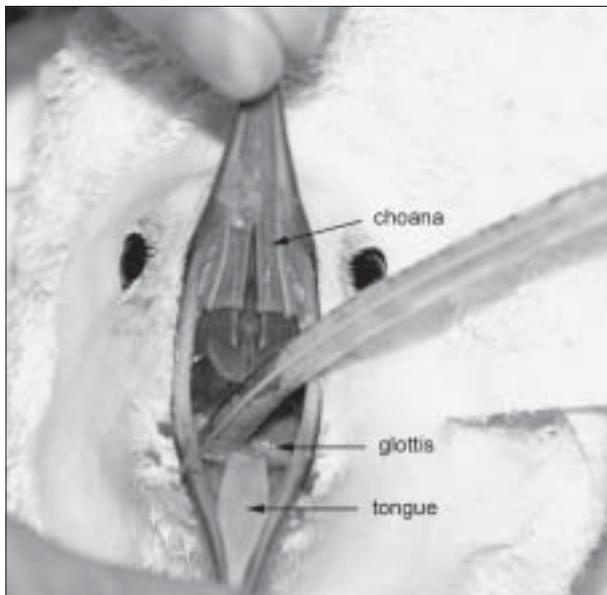
the vacuum (so as not to damage walls of the crop or oesophagus), withdraw the tube and release the bird.

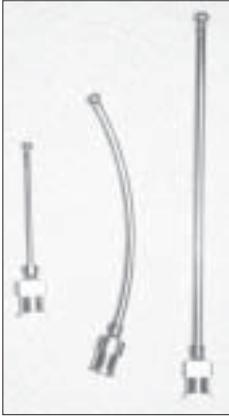
- For birds that have a crop, stop administering fluid when the bulge extends half way up the bird's neck.
- Vytrate® and Polyaid® or a 50:50 mix of Hartmanns and 5% Dextrose solution are used successfully for fluid and electrolyte replacement in sick birds. Make up these solutions

It is often easier to tube-feed with two people; one gently but firm holds the bird, the other feeds.



Note the position of the choana and glottis in relation to the feeding tube.





Crop needles are available a in variety of shapes and sizes.

according to the instructions. Your local vet should be able to supply some of these fluids.

A sick, dehydrated bird initially requires fluids as a priority over food. Add small amounts of liquidised food into the electrolyte solution once the bird is rehydrated and stable. Gradually increase the ratio of liquidised food as the bird gains strength. Make the food mixture energy and nutrient dense, easily digested and able to pass through a narrow diameter tube; e.g. parrot rearing mix for psittacines and pigeons; Hills a/d® for seabirds.

Most species will need only water to supply their ongoing fluid needs once they are well enough to take solid food by themselves.

Do not leave water bowls in the enclosure of a weak, sick bird that may flop into the bowl and drown or chill itself. Appropriate and safe size and shape of water bowls will depend on the age, species, moult status and health status of the individual bird.

This bird's glottis is clearly visible behind its tongue. A feeding tube has been passed into the oesophagus.



FEEDING

You may have to initially force-feed sick birds. Never force-feed whole food to a chilled bird because it will be incapable of digestion. Instead, first warm the bird and then tube feed. Encourage the bird to start feeding as soon as it is warm and strong enough. After a day or so of force-feeding, most birds will eventually feed themselves when a tray of food is left in their enclosure. Signs of readiness for self-feeding include sitting upright or perching (depending on species), moving its head and swallowing normally. Identify what sort of foods and feeding methods the species uses in the wild, even though the captive diet is likely to involve substitutions. 'Teaching' the bird to recognise its captive diet as food may depend on cunning methods of food presentation based on knowledge of the bird's natural behaviours.

A complementary document will be produced to guide Wild City Neighbours volunteers on the specific diets and quantities of food needed for each species.

Important points for feeding wild birds:

- Take care not to contaminate feathers with spilt food.
- Select food containers that cannot be tipped over and are too small for the bird to sit in.
- Try to include natural foods in the captive diet wherever possible and present foods in a way that encourages natural foraging behaviour.
- Ensure fresh food is available to the bird at its normal foraging time day and/or night.
- Leave the bird undisturbed to feed in privacy.

Adapt feeding methods appropriate for each individual bird:

- Small volumes of fluid or liquidised food mixture can be given onto the bird's tongue from an eye dropper or syringe. Some birds (e.g. silvereyes) will quickly learn to take drops of glucose solution presented from the tip of a syringe at the side or tip of their bill. This method is useful for getting an anorexic

bird to start feeding but it can be messy. It is often difficult to supply the volumes needed to provide the bird's daily nutritional requirements.

- Alternatively you can use an ice-cream stick, with the tip cut down (with smooth, rounded edges), to the appropriate size for the bird or blunt ended forceps or tweezers, to gently push small pieces of food over the tongue. Take care to avoid spilling food near the glottis.
- Birds such as kereru can be force-fed by simply opening their beak and pushing lightly cooked moist peas (cooled to room temperature) down their throat. Take care to keep the glottis clear and ensure your hands are clean, and fingernails short. Use the same method to deliver pieces of day-old-chick, mouse or other 'prey' items to a raptor, or fish to a seabird.

THE CAPTIVE ENVIRONMENT

Large boxes (such as TV or microwaves boxes), plastic cages or small aviaries are suitable for short-term care of seriously injured birds. These enclosures should restrict some movement but be large enough for the bird to stretch its wings out and move around without touching the sides. Each cage must provide a secure warm environment that can be darkened if necessary. Line cage floors with newspaper or paper towels and change once or twice daily. Never use straw because it is a source of fungal spores that can cause Aspergillosis in birds. The ideal cage design has a slide-out false floor, allowing you to clean the cage with minimal disturbance to the bird.

Provide suitable perches for species that will use them. Perches should be of uneven diameter and large enough to prevent the bird's hallux (back toe) from injuring its metatarsal pad (foot sole). Some species (e.g. morepork) prefer a flat surface to perch on. Most species feel more secure on high perches but injured or weak birds should initially be restricted to low perches for their safety. Regularly clean any faecal material or food scraps from perches. Be careful to place food and water containers in positions where they are easily accessible to the bird but cannot be fouled by droppings; i.e. not on the floor directly under perches.

Soiling of the bird's skin and feathers is a problem commonly associated with force feeding and confinement in a relatively small area. If a bird's plumage is not maintained in near-perfect condition while in captivity, its chance of survival after release will be severely compromised. Healthy plumage is essential for flight, waterproofing, thermoregulation and (for aquatic birds) buoyancy.

AVIARIES OR ENCLOSURES

Wild birds in captivity can extensively damage feathers by flapping against wire cages or aviary wire. Line aviaries and other enclosures with vertical wooden slats, windbreak netting or similar materials to prevent extensive feather damage while the bird is held in captivity. Ensure that there are no sharp edges, protruding objects or loops of material within the enclosure that could potentially injure or entangle the bird.

A bird that has been confined indoors or restricted to a small enclosure for more than a few days should be placed in a larger outdoor enclosure prior to release. Here it can acclimatise to daylight, variable weather and build up some fitness. If a bird was taken into captivity because it could not fly, you need to observe it attempting to fly in an aviary of suitable size to assess fitness for release.

Outside enclosures should provide the bird with access to both sunlight and shade. Aviaries that allow clear visibility on all four sides can be quite stressful for wild birds because birds are constantly on the alert for a predator approaching from any direction. Consider putting up a temporary visual barrier on at least the lower part of three sides. Make sure the enclosure continues to have adequate ventilation and partial sun. Some birds may feel more secure if they can retreat to high perches or secluded areas (e.g. roost boxes or foliage). Temporarily place non-toxic, live potted plants in an aviary. Swap them for clean plants for use by the next occupant. Avoid the use of permanent, live plants in an aviary as they make it difficult to sanitise the aviary between occupants.

Design the floor of the aviary for ease of cleaning. Replace clean, dry sand frequently to minimise the build-up of parasites in an aviary. Thoroughly clean and where appropriate, spray aviaries for mites between occupants.

Most land birds will appreciate access to a shallow water bath. Check that the base provides good traction and the sides allow easy exit. Make sure the bird is strong enough not to get chilled or drown before putting water baths in a cage. Birds held in indoor cages may benefit from mist-spraying of their feathers to stimulate preening.

Where there is more than one bird in an enclosure, it is important to have a temporary but reliable way of identifying each individual (e.g. a small spot of twink on the back of an individual's head).

It is important to keep birds hydrated during the entire time they are in captivity. This kokako (*Callaeas cinerea*) is given plenty of water during a transfer.



Ongoing care

You need to regularly monitor the progress of birds in your care.

Daily observations without handling the bird (see Appendix 1).

- Observe the bird's posture and general behaviour: is it alert, breathing and vocalising normally, moving freely about its enclosure and showing normal feeding and preening behaviours for its species?
- Check for evidence of regurgitated food (soiling of feathers around the beak and head, regurgitated food on the floor) and try to assess how much food the bird is actually eating.
- Observe how any abnormalities change over time and monitor wound healing and response to treatment.
- Look for the development of secondary problems associated with captivity, such as pressure sores, feather damage and soiling, and cloacal impaction or diarrhoea.
- Note whether droppings are being excreted and whether they are normal in colour and consistency.
 - *Healthy droppings*: should consist of green to brown faeces with white-yellow urates.
 - *Abnormal droppings*: may consist of faeces that are black and tarry, bright green and loose or contain blood or gas bubbles. Yellow, green, brown or bloody urates may be a sign of ill health.

The frequency of recapture for weight and condition monitoring, progress checks and data recording will depend on the nature of the bird's health problems. It is vital to monitor the bird's weight and condition; avoid any unnecessary recaptures because this is stressful to the bird. It is sometimes possible to get the bird to weigh itself when it steps onto a feeding platform or perch attached to scales.

Weight loss or failure of a thin bird to regain weight means that you may need to alter the bird's food type and/or quantity and reassess any stressors or undiagnosed disease. Most birds will be

underweight on entering captivity. Be aware of the normal weight range of each species and take into account age, sex and season since these factors can cause big variations in weight in some species. Birds should be at a healthy weight when released.

Release considerations

People who specialise in bird rehabilitation, vets or experienced bird staff within DOC are able to help you assess whether a bird has fully recovered and meets all release criteria. You should plan to release the bird where it was found unless there are particular hazards in that area. Contact DOC if you think the place where the bird was found does not have adequate habitat or food for the bird's requirements. In some instances, DOC may be interested in releasing birds at a location where management may provide additional protection for the bird.

Hall's (2000b) assessment protocol for the release of birds requires that birds must:

- Be acclimatised to weather and photoperiod.
- Exhibit normal feeding behaviour and recognise natural food sources.
- Be in good body condition with a body weight in the normal range for its species and have good pectoral muscle mass and near-perfect plumage.
- Exhibit normal wild behaviour; e.g. looks for escape routes, flies/runs/swims strongly to the far end of the enclosure when disturbed; restless rather than apathetic; seeks shelter in inclement weather; active at times of day/night appropriate for species.
- Be fully recovered from all physical problems.
- Be waterproof and able to maintain normal body temperature after several hours on the water (for seabirds).
- Be salt-tolerant (for seabirds).
- Be released at an appropriate time:
 - Release migratory waders at least one month prior to their migration date.
 - Release species that are active during the day one hour after dawn and nocturnal species one hour after dusk to avoid intense competition for food during the first hour of the active part of their day.

- Release pelagic seabirds on a windy day (some species cannot become airborne at wind speeds of less than 25 knots) from a coastal cliff top or from a boat at sea. Smaller species may be released at dusk to avoid predation by black-backed gulls and because many of the smaller petrels and shearwaters are crepuscular or nocturnal feeders.

Glossary

Anaemia – lack of red corpuscles, or their haemoglobin in the blood; causes pale mucous membranes and weariness.

Anorexic – refusing food.

Anterior chamber – the space inside the eye between the cornea and the iris. Normally this space is filled with clear fluid but head trauma cases may have blood in their anterior chamber.

Aspergillosis – a disease of the lungs and air sacs caused by one of several species of the fungus, *Aspergillus*, which is very common in the environment. Infection is through inhalation of spores. Disease develops when these spores germinate and grow in animals that are stressed, have an impaired immune system or are exposed to large numbers of spores (e.g. from damp straw).

Asymptomatic carriers – individuals that are infected with a disease agent but show no signs of being unwell. These individuals can be an important source of infection to others.

Avian – of birds.

Bilateral symmetry – capable of being halved on one plane in such a way that the two halves are approximately mirror images of each other.

Carpus – the wrist or visible wing joint that points forward when the bird folds its wings.

Cere – the area of soft tissue at the base of the upper beak surrounding the nostrils.

Choana – slit in the roof of the mouth connected to the nasal passages.

Cloaca – cavity through which the bird's excretory products (faeces, urates and urine) and eggs pass immediately before exiting the vent.

Conjunctivae – tissues inside the eyelids.

Conspecifics – others of the same species.

Crepuscular – active at dusk or dawn.

Crop – a dilatation of the oesophagus in many birds (e.g. parrots, pigeons) where food is temporarily stored before reaching the stomach (see Appendix 2).

Diurnal – active during the day.

Electrolyte solution – a fluid replacement solution containing primarily sodium, chloride and potassium. A dehydrated animal has lost these salts along with water.

Femur – the thigh bone.

Gavage – the force-feeding of fluids or a pureed food mixture through a tube placed into the bird's digestive tract. Fluids are usually delivered into the crop of birds which have a true crop (e.g. parrots, pigeons), or the lower oesophagus or proventriculus (first part of the stomach) in birds that do not have a crop (e.g. owls and many seabirds).

Glottis – the entrance to the trachea or airway.

Hallux – birds' back toe.

Hock – the leg joint between the tarsometatarsus and tibiotarsus (see Appendix 2).

Humerus – the bone between the shoulder and the elbow (see Appendix 2).

Hyperthermic – over-heated or heat-stressed. The bird is likely to pant and hold its wings out from the body. Most hyperthermic birds will have a cloacal temperature above 42°C.

Hypoglycaemic – having low blood sugar. Can cause signs ranging from weakness to convulsions or death.

Hypothermic – too cold. The bird is likely to be fluffed up, feel cold and may appear sleepy. Cloacal temperature will usually be below 37°C.

Iris – the coloured part of the eye surrounding the pupil.

Isotonic – a solution that has the same osmotic pressure as body fluids. Osmotic pressure being determined largely by its concentrations of salts. It is safe to give a dehydrated bird an isotonic solution, whereas a hypertonic ('too salty or sugary') solution can worsen the bird's condition by drawing body fluids away from where they are needed and into the gut.

Keel – the sternum or breastbone (see Appendix 2).

Mandibles – the upper and lower beak.

Metatarsal pad – bird's foot sole.

Mucous membranes – normally pink tissue lining the mouth, cloaca, inside eyelids etc.

Nematode – worm with non-segmented cylindrical shape, often parasitic.

Nocturnal – active during the night.

Oesophagus – gullet.

Pelagic – seabirds that live at sea continuously after fledging, coming ashore only for courtship and breeding.

Periorbital – the area around the eye, including the eyelids.

Pharynx – the back of the bird's mouth behind its tongue; leads to the oesophagus.

Pneumonia – inflammation or infection of the lungs.

Psittacines – a family of birds that includes budgies and parrots.

Pupil – the black window in the middle of the iris. Both pupils should be the same size. Pupils should constrict in bright light and dilate in darkened conditions to adjust light reaching the retinas.

Radius – the thinner of the two bones between the elbow and the carpus (the opposite to most mammals).

Renal – of or from the kidneys.

SBL – 'Sick Bird Look'; showing some of the symptoms listed in the 'Distance inspection' (see Appendix 1).

Spores – a stage in the life cycle of many fungi and bacteria that allows them to survive adverse environmental conditions until infecting a new host.

Sternum – the keel or breastbone.

Stifle – knee.

Subcutaneous – under the skin; e.g. subcutaneous emphysema refers to air pockets under the skin that may result from damage to air sacs or pneumatic bones (but can be normal in some diving seabirds).

Tarsi (plural of tarsus) – more correctly termed 'tarsometatarsus'; this is the unfeathered part of the bird's leg immediately above the foot and below the hock.

Thermoregulation – the ability of an animal to keep its body temperature within normal limits. Sick birds are often unable to maintain their normal body temperature unless kept in a warm place.

Third eyelid – a translucent membrane lying under the inner corner of the bird's eyelids that can be drawn across the cornea for additional eye protection.

Tibiotarsus – the part of the leg between the bird's hock and its knee.

Ulnar vein – a vein that runs along the under-surface of the wing; best observed close to where it crosses the elbow. The speed and extent with which this vein fills after brief occlusion forms part of the assessment for dehydration and shock.

Ulna – the thicker of the two long bones between the elbow and the carpus.

Urates – the white part of a bird's droppings. Urates, together with clear liquid urine, comprise the excretory products of a bird's kidneys.

Zoonoses – diseases carried by animals that are infectious to people.

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Bibliography

- Cannon, M. 2000: Medicine and surgery of aquatic birds. Pp. 313–349 in: Birds 2000, Proceedings 334. University of Sydney Post Graduate Foundation in Veterinary Science.
- Gartrell, B. 2002: Fluid therapy and analgesia of birds. Wildlife Society of New Zealand Veterinary Association Conference, Napier, 28–30 November 2002.
- Heather, B.D.; Robertson, H.A. 1996: The field guide to the birds of New Zealand. Viking.
- Hall, E. 2000a: Transport, handling and husbandry of seabirds. Pp. 319–333 in: Marine wildlife, Proceedings 335. University of Sydney Post Graduate Foundation in Veterinary Science.
- Hall, E. 2000b: Rehabilitation and release of seabirds. Pp. 335–357 in: Marine wildlife, Proceedings 335. University of Sydney Post Graduate Foundation in Veterinary Science.
- Lee, E. 2000: Avian assessment and first aid. Pp. 59–68 in: Wildlife health in conservation (2000). Publication No. 204. Foundation for Continuing Education of the New Zealand Veterinary Association.
- Miskelly, C.; Williams, R. 2002: Transfer of fairy prion (titiwainui) chicks from Takapourewa to Mana Island, January 2002. Department of Conservation report.
- Robertson, C.J.R. 1985: The complete book of New Zealand birds. Readers Digest.
- Vogelnest, L. 2000: Veterinary management of seabirds. Pp 199–235 in: Marine wildlife, Proceedings 335. University of Sydney Post Graduate Foundation in Veterinary Science.

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Appendix 1: Avian examination

(copied with permission from Lee 2000)

STAGE 1: DISTANT INSPECTION

Identification:	Species _____	Colour _____	
	() juvenile	() adult	
Emergency Signs:	() Sick Bird Look*	() lateral, sternum, wings extended, using beak support	() flaccid/kinked neck
	() unconscious	() convulsion	() injury/blood
	() severe lameness	() dropped wing	
	() gasping respiration	() loss waterproofing	
Food Intake:	() normal	() decreased () not observed	() not eating
Water Intake:	() observed drinking	() not observed	
Droppings:	() normal consistency	() watery	() dry () decreased no.
White fraction:	() normal amount urates () urine present	() colour _____	() absent
Dark fraction:	() normal size	() colour _____ () undigested food	() absent
Consciousness:	() alert	() depressed	
Behaviour:	() normal	() abnormal _____	
Posture:	() normal standing	() dropped wing R L () extended leg R L	() extended wing R L () lame R L
Respiration:	() normal	() shallow & fast () open-mouthed () voice change	() deep & fast () noisy/ rattling () voice loss
	<i>NB. Handle carefully if abnormal</i>		
Head:	() normal	() asymmetry () nasal discharge	() eye problem R L () beak abnormality
Body:	() normal shape	() enlarged abdomen/mass	() faeces around vent
Feathers:	() normal plumage	() feather loss () abnormal structure	() broken feathers
Summary of Problems	1. _____		
	2. _____		
	3. _____		
	4. _____		

Appendix 2: Avian examination

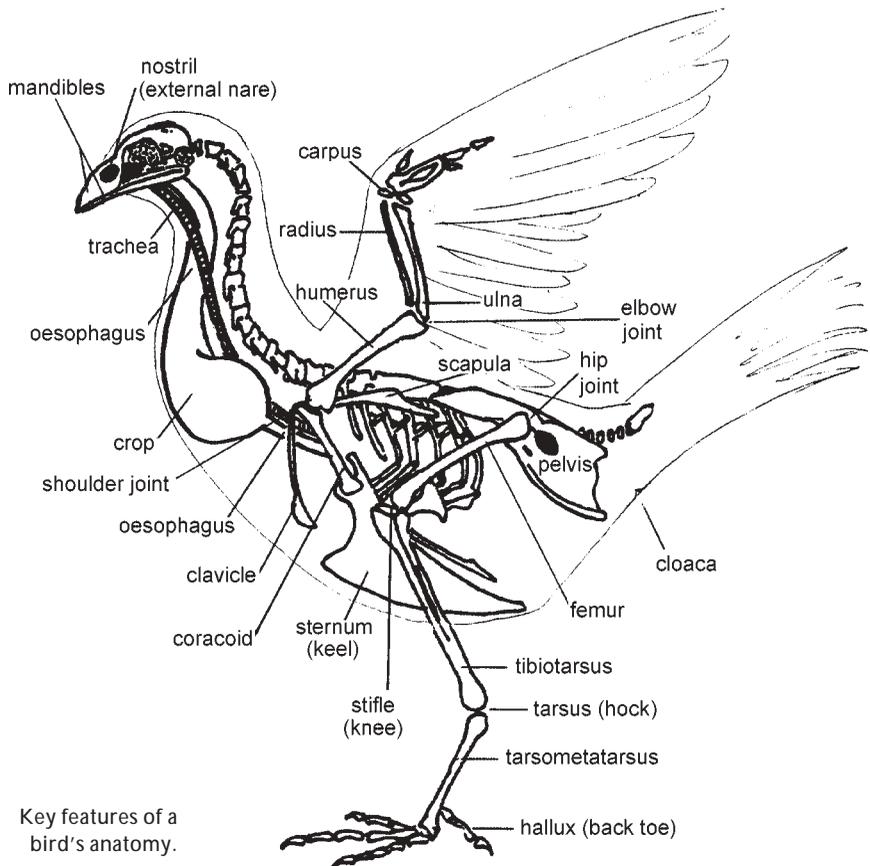
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STAGE 2: PHYSICAL EXAMINATION

*see glossary for definitions Normal √ Abnormal x

Identification:	Sex: M F	Band No: _____	Age _____
Nutritional condition:	body score: emaciated thin normal overweight obese weight _____ average weight for species/age _____		
Hydration:	() moisture pharyngeal mucosa () filling ulnar vein* () T ⁰ extremities		
Head:	() eye discharge R L () periorbital swelling* R L () 3 rd eyelid* R L () cornea* R L () anterior chamber* R L () iris* R L () pupil: dilat'd/const'd* R L () nasal discharge () nostril R L () cere () beak () ear canal R L () oral mucosa: colour () tongue () choanal discharge lesions () feather staining: top of head, around nostrils () other findings _____		
Neck:	() enlarged crop () dilated air sac () subcutaneous air* () other findings _____		
Body:	() mass () sternum to pubis () vent: faecal staining concave everted mucosa mass winking () trauma () other findings _____		
Musculo-skeletal:	() weak to handle wings: () position R L () strength R L () range joint movement legs: () position R L () shafts long bones R L () range joint movement () muscle bulk R L () toes: joint movement R L () nails R L () other findings _____		
Feathers:	() normal () feather loss: position _____ () broken feathers () stress lines () tube feathers () blood feathers () shaft weakness () waterproof () feather cysts () moult () parasites		
Skin:	() trauma skin () preen gland () skin legs () interdigital webs () sole feet L R () other findings _____		

Summary of Problems	1.	_____
	2.	_____
	3.	_____
	4.	_____
Actions:	1.	_____
	2.	_____
	3.	_____
	4.	_____



Appendix 4: Checking for external parasites

- Part feathers and examine the feather shafts and skin, particularly around the face, ears, neck, vent and under wings.
- Feather mites and lice feed on dead skin. They are generally harmless at low densities and won't survive on humans or other mammals. Heavy infestations may require treatment, especially if body condition is poor. Treat with pyrethrin-based sprays or powders.
- Blood-sucking mites and ticks can cause anaemia through blood loss and act as disease vectors. Some *Ixodes* ticks can also secrete paralysing nerve poisons. These mites and ticks can be more difficult to eradicate from the bird and its environment, and tend to infest a wider range of hosts—good reasons to remove them and have them identified.
- *Ixodes* ticks generally congregate around the bird's head and neck. When feeding, the tick's mouthparts are embedded in the bird's skin.
- To remove a tick, grasp behind its head with forceps and pull gently backwards. Try not to break off mouthparts that can remain in the bird's skin. A drop of alcohol or kerosene on the tick may help to detach it.
- Frontline® and Ivomec® have been used to kill bird ticks and mites, respectively. Note that these are 'off label' uses of products not licensed for use in birds. Seek vet advice before using any product 'off label' as its use can be dangerous to the bird.
- Live ticks can survive for months or years in the environment until they or their eggs infect a new host, so it is vital to ensure your aviaries remain tick-free.
- To prevent any ticks from migrating beyond the bird's temporary cage, rest the cage in a larger container of shallow water; this 'moat' will contain the ticks, which you can then collect and kill.
- Thoroughly check the bird is tick-free before transferring it from its temporary cage to an aviary.

Collect parasites and store specimens in leak-proof unbreakable containers filled with 70% ethanol, methanol or high-proof drinking spirits. Label each with the host species, date and place found, your name and contact details. Well labelled specimens can add to knowledge of which parasites are found where, and on what bird species.

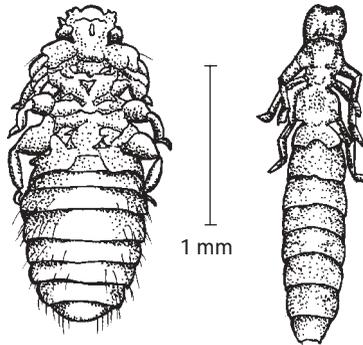
Send lice to:

Ricardo Palma
Museum of New Zealand
PO Box 467
Wellington

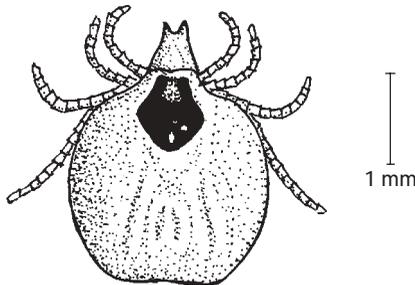
Send ticks to:

Allen Heath
AgResearch
PO Box 40063
Upper Hutt

Lice are flat, wingless insects which spend their entire life on the bird and come in a variety of forms.



This is an example of an *Ixodes* tick. Note that the female tick can swell to more than twice this size when engorged with the bird's blood.



NATIVE BIRD REHABILITATION GUIDE FEEDBACK FORM

The information supplied in this booklet should help injured-bird caregivers in the rehabilitation of sick and injured birds. In the near future additional information will be gathered into a second edition of this guide—information such as requirements of individual species and their differing needs including diet, housing and release considerations. To do this we need some feedback from you, the experienced injured-bird caregivers. Any information you can supply will be invaluable for the production of subsequent editions.

1. What additional information would you find useful for inclusion in this guide?
2. What experiences can you share that may help others who are caring for injured wildlife?
3. Can you give specific information on any species care, welfare or requirements while in captivity (e.g. diet, housing, vulnerability to disease etc)?
4. Please suggest any further improvements to this guide.
5. If you have any good-quality pictures of sick or injured birds and/or people looking after them, we may be able to print these in the next edition (with full acknowledgement).

Please send comments or responses to this questionnaire to:

Poneke Area Office
Department of Conservation
PO Box 5086
Wellington

Ph: (04) 472 5821

Fax: (04) 4990077



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