Bat Conservation Trust

Bat Care Guidelines

A guide to bat care for rehabilitators

2nd edition

Foreword

The Bat Care Guidelines (2nd edn) builds on the first edition (2008) which was produced as a result of a Bat Care and Rehabilitation Best Practice Workshop held in early 2007. This second edition includes updates to existing chapters as well as new sections on baby bats, flight cages, horseshoe bats and support for rehabilitators.

These guidelines are aimed at veterinary professionals, wildlife hospitals and rehabilitators. The document is split into basic sections which aim to provide minimum guidelines for bat care. This booklet also aims to provide further references in which detailed guidance and information can be found.

Acknowledgements

The Bat Conservation Trust (BCT) would like to extend its thanks to Maggie Brown of the West Yorkshire Bat Hospital who gave a significant amount of her time to help produce this second edition.

In edition we would like to thank the following individuals for their contributions and comments:

- Full draft commentators: Gail Armstrong, Jenny Clark, David Couper, Val Gall, Adam Grogan, David Jackson and Tracey Joliffe.
- Ailments and treatment, Medicines chapter contributors: Sarah Goodwin, Lesley Helliwell and Andrew Routh,
- Baby bats chapter contributors: Chris Harlow, Amanda Millar, Samantha Pickering and Kit Wood,
- Horseshoe bats contributor: Samantha Pickering,
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Finally we would like to thank all those who helped to fund the second edition. This includes the attendees of the National Bat Care Conference 2015 (the proceeds of the raffle at this event were put towards these guidelines) and those who donated through a crowdfunding appeal. In particular we would like to thank the following supporters who each donated £500 to the appeal: Sussex Bat Group, South Lancashire Bat Group, Surrey Bat Group and Nick Tregenza from Chelonia Ltd.

A full list of supporters can be found here: http://www.bats.org.uk/pages/bat_care_supporters.html

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Bat Care Guidelines

A guide to bat care for rehabilitators

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Things you must have/do

- Contact details
  - ✔ You must obtain contact details of where the bat was found – this is required for eventual release.
  - ✔ You must have details of all individuals that have handled the bat.

- Consideration of health and safety
  - ✔ Always wear gloves when handling a wild animal.
  - ✔ All individuals regularly handling bats should be vaccinated against rabies.
  - ✔ Every effort should be made to minimise the risk of zoonotic diseases.
  - ✔ Anyone bitten or scratched by a bat must seek medical advice immediately and contact the Bat Conservation Trust (BCT) (see Further information, support and references).

- Handling
  - ✔ Should be kept to a minimum.
  - ✔ Avoid actions that may stress the bat except where necessary to assess condition.

- Isolation
  - ✔ All bats should be kept in isolation until released (see Health and safety section for context).

- Rehydration
  - ✔ Nearly all bats that are brought into care will require rehydration before they are released.
  - ✔ Most bats will show a marked improvement in their condition following rehydration and will react more positively to food and treatment.

- Consider ethics
  - ✔ Ethics should underpin every decision.
  - ✔ The short and long-term care and welfare of the bat should always be considered.

- Keep a record
  - ✔ A record should be kept of the bat's care; this will include information about how and where it was found, injuries, treatment and progress.
  - ✔ This is important for both successful release and licensing implications.

- Experience
  - ✔ Consider your own experience and abilities.

- Resources and time
  - ✔ Consider the resources required for short and long-term care e.g. housing, food, flight cages.
  - ✔ Consider the time that you will be able to give to a bat's care and that needed for successful rehabilitation, e.g. rearing a baby, long-term captives.

- Support
  - ✔ Be aware of contacts and references for further information and support.
  - ✔ Good relations between a rehabilitator and an experienced vet are essential.
  - ✔ The support of an experienced bat rehabilitator is important for all new rehabilitators.

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Basic equipment

Health and safety

Check list

Health and safety	
Handle bats with gloves	✔
Minimise handling	✔
Consider the welfare of the bat AND handler	✔
Keep bat isolated	✔
Identify the species	✔

Handling and gloves

- ✔ Bats are wild animals and, although not naturally aggressive, may become so when scared or in pain.
- ✔ Gloves should always be worn when handling bats – the thickness of the glove will depend on the species you are dealing with and the duty being carried out (e.g. handling, feeding, treating an injury, etc). A full list of suitable gloves is available from BCT.
- ✔ A record should be kept of **every** individual that handles the bat.
- ✔ Separate gloves, to prevent disease transmission, should be used when handling different bats. For example disposable gloves can be worn over the top of other gloves.
- ✔ Handling of the bat should be kept to a minimum – some of the initial diagnoses can be carried out without touching the bat itself (see Rescue and collection section). This will reduce stress to the bat and reduce human contact.
- ✔ It is paramount that consideration be given to the health and safety of both the bat AND the handler.

Isolation

- ✔ All bats suitable for eventual release should be kept isolated from other individuals (unless from the same known roost). See Care and conditions section for more information on keeping bats in captivity.
- ✔ Bats are wild animals and as such may carry or be susceptible to infectious disease.
- ✔ Separate gloves should be used for each bat in your care. Separate tweezers and other equipment should also be considered.
- ✔ It is recommended that any equipment should be sterilised after use. Clean with hot soapy water to remove any dirt and then clean again with bleach diluted 1 part bleach to 30 parts water to prevent disease transmission. Iodine based disinfectants or general purpose quaternary ammonium compound disinfectants can also be used for surfaces.
- ✔ Initial isolation is essential to:
  - Minimise the stress to the bat,
  - Speed up recovery,
  - Reduce the risk of disease transfer between the bat and carer,
  - Reduce the risk of disease transfer between the bat and other bats.

*If, as an experienced rehabilitator, you decide to keep two or more bats together in the same container, you **must** be prepared to accept the consequences for all individuals should one be confirmed to have an infectious disease.*

Identification of species

- ✔ It is important to try and identify the species of bat in your care. Although this may not be essential for the initial care and first aid of the animal it is necessary if you are dealing with a rare or non-native species.
- ✔ A small number of bats in the UK are known to carry European Bat Lyssavirus – this makes it essential to be able to identify these species (although health and safety should be considered for all individuals regardless of species).
- ✔ Occasionally non-native species are discovered in the UK, having travelled independently or discovered in freight and storage that has been transported from abroad. Any non-native species must be kept isolated from all other bats. Please call the BCT helpline in this situation for further advice.
- ✔ For more information and help to identify the species in your care (see Further information, support and references section for further details):
  - Field Studies Council – A guide to British bats,
  - Dietz & von Helverson – Illustrated identification key to the bats of Europe,
  - Altringham - British bats,
  - Greenaway & Hutson – A field guide to British bats (out of print),
  - Stebbings, Yalden & Herman – Which bat is that? (out of print).

European Bat Lyssavirus (EBLV)

- In the UK a small number of bats are known to carry European Bat Lyssavirus (EBLV) a type of rabies.
- There are two strains EBLV1 and EBLV2.
- To date in the UK, no individuals have been found with the live EBLV1 virus – although a single serotine bat and two Natterer's bats have tested positive for the antibodies to EBLV1.
- EBLV2 has been recorded in one species of UK bat – the Daubenton's bat. The number is, however, very low with just thirteen individuals testing positive for the live virus in the UK (number correct as of August 2016).
- EBLV is usually transferred via a bite or a scratch. It can also be transferred if a bat's saliva comes into contact with a mucous membrane or existing cut.
- To date (August 2016) there have been no incidences in the UK of EBLV being transmitted to a domestic pet (or any other animal).
- Anyone bitten or scratched by a bat should contact BCT for further advice.
- We still have limited knowledge of the virus and how it is spread – it is therefore necessary for gloves to be worn when handling bats.
- Individuals regularly handling bats should be vaccinated against rabies – free vaccinations are available and further information can be obtained from BCT.
- Passive surveillance of the virus in the UK has been carried out since 1987. This relies on the submission of dead bats to the Animal and Plant Health Agency (APHA) for testing. For further information please contact BCT.
- If a bat is suspected of having rabies (i.e. it is exhibiting abnormal behaviour for the situation) it must be:
  - Contained securely,
  - Isolated from all other bats – this should be in a separate room away from other bats and pets. Separate gloves and equipment should be used (see isolation section),
  - The BCT helpline should be contacted for advice (see Further information, support and references). BCT will need to liaise with APHA regarding the bat.
- Additional information is available in BCT's Good practice guidelines on bats and rabies (see Further information, support and references).

White-nose syndrome (WNS)

- Bat carers should be aware of the symptoms of WNS which has devastated bat populations in North America. These symptoms are:
  - Bats with a white fungus (*Pseudogymnoascus destructans*), particularly around the nose, but also on the wings, ears and/or tail,
  - Bats clustered near the entrance of hibernacula, or in areas not normally identified as winter roost sites,
  - Bats flying outside during the day in temperatures at or below freezing, and/or
  - Dead or dying bats in or near hibernation sites.
- In the UK (and Europe) the fungus is present but without the mass mortality or other symptoms observed in North America – suggesting that our bats have a resistance to the fungus developed over thousands of years.
- BCT has released specific guidance for bat carers detailing signs to look for and processes to follow (see Further information, support and references for further details).

Mealworm allergies

- Some carers can develop allergic reactions to mealworms.
- Allergic reactions can affect the eyes, nose, lungs and skin.
- Good practice for dealing with mealworms involves:
  - Limiting exposure to mealworm dust and frass (waste),
  - Wearing masks and gloves when in contact with mealworms.
- BCT has developed good practice guidelines (see Further information, support and references).

Education

- Only bats that cannot be released back into the wild should be considered for education (releasable individuals should be handled as little as possible). Further information about licence conditions for keeping bats for education is provided in Legislation, licensing, equipment and expertise.
- Daubenton's bats should not be used for public engagement events.
- All images of bats used for public engagement should be in gloved hands.
- To reduce the risk of transmission of zoonotic disease any bat to be used for education **must** be kept isolated from other bats for ***at least six months*** (also see Care and conditions section). This isolation period is essential to ensure the health and safety of the bat, the handler and the general public.
  Rehabilitators should be aware that the rabies virus (EBLV) can remain dormant in an individual for some time, and as such, best practice and caution should be exercised before, during, and after the isolation period.
- If the decision is made to keep the bat as a permanent captive (see Ethics section):
  - The general public should not be allowed to handle the bats,
  - Rehabilitators must wear gloves at all times when showing bats to the general public,
  - Ground rules for PR events should be based on the welfare of the bat. The RSPCA have produced some useful guidelines **www.rspca.org.uk/adviceandwelfare/performinganimals**.
  - Showing of a bat in the hand should only constitute the last few minutes of a talk,
  - Hand-wash facilities for the handler are necessary at events – to reduce the spread of zoonoses. Bat carers can provide their own if necessary, for example, alcohol hand rub.

Ethics

Check list

Ethics	
Consider ethical context	✔
Consider possible outcomes for bat	✔
Justification for keeping the bat	✔
When to euthanise	✔

In every decision you must decide: What is best for the bat?

- It is essential to ask:

Does the welfare cost outweigh the welfare benefit?

- ✔ How much distress will the bat be caused?
- ✔ How long will the bat take to recover?
- ✔ What will the bat's quality of life be during and following treatment?
- ✔ Do you have, or can you access, facilities that will be necessary to look after the bat for the duration of its time in care?

- Ethical context

When treating an individual consideration should be given to the ethical context of any treatment or care decisions. The following should be considered:

- ✔ Short-term care of the bat,
- ✔ Long-term care of the bat,
- ✔ Welfare of the individual bat,
- ✔ Impact on local bat populations (if released),
- ✔ Impact on the wider environment (e.g. disease),
- ✔ Resource impacts.

- Possible outcomes

For each bat brought into care there are three possible outcomes to consider. This section identifies the key questions that anyone caring for a bat should use to make this decision. The outcome will depend upon the individual rehabilitator's ability to assess the bat in terms of these considerations.

Please note that these questions are not meant to be specific and instead should be used as a general guide to aid in the decision-making process. For detailed information please refer to the Bat Rescue Manual and BSAVA Guidelines.

1. Rehabilitation and release

This option should always be the primary goal of a rehabilitator. Bats are wild animals and should be treated with the aim of successfully releasing them back into the wild.

Successful rehabilitation and release will depend upon:

- ✔ The bat's chance of survival in the wild following rehabilitation (see Rehab and release section),
- ✔ The ability to minimise distress caused to the animal whilst in care,
- ✔ The length of time that a bat would need to remain in care before being suitable for release,
- ✔ Adequate resources/provisions for rehabilitation,
- ✔ The process having no detrimental effect on wild populations.

2. Permanent captive

Captive bats represent an important educational tool for their wild counterparts. Many experienced bat rehabilitators will possess a small number of bats (unsuitable for release) which they will take to events and talks with the general public.

Education is the only purpose for which a bat can be kept in permanent captivity (see Legislation, licencesing, equipment and expertise>Licensing).

Only bats that cannot be released should be considered for permanent captivity, and the decision to keep a bat should be made, after reviewing the following questions:

- ✔ Is there any reason why the bat cannot be released? If yes, then
- ✔ Can keeping the bat in captivity be justified?

Justification should be based upon:

- ✔ The bat's quality of life in captivity,
- ✔ The possible use of the bat for education:
  - ◆ Natural temperament,
  - ◆ Species,
  - ◆ Condition of bat.
- ✔ The experience and knowledge of the rehabilitator – to provide the level of care needed,
- ✔ The time and resources available for long-term care e.g. housing, food, room for exercise, company, etc.,
- ✔ The number of permanent captive bats already possessed by a rehabilitator.

3. Euthanasia

The option to euthanise a bat should be made where the welfare cost to the bat is greater than the benefit. Euthanasia should be considered at every stage of the decision-making process.

Euthanising a bat in your care is often the kindest and most sensible option if:

- ✔ It is (or will be even with treatment) in considerable pain,
- ✔ It has multiple injuries/ailments,
- ✔ After treatment the bat will still have a poor quality of life.

In certain situations euthanising the bat will be the most appropriate outcome and the list below gives examples of these. This may involve diagnosis by a vet:

- ✔ If the bat cannot roost, eat and/or groom,
- ✔ If the bat is terminally ill (and in constant pain),
- ✔ If the bat has a fractured spine,
- ✔ If the bat is suffering from internal bleeding,
- ✔ If major organs are exposed, such as the abdominal viscera,
- ✔ Metabolic bone disease, with ongoing possibility of fractures,
- ✔ Major damage to larger bones in one or both wings that will prevent flight, may cause further complications and is likely to cause considerable pain.

Please note that this is not an exhaustive list and the decision to euthanise a bat will always need to be made on a case-by-case basis.

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Captive bats are an important educational tool

Rescue and collection (first aid)

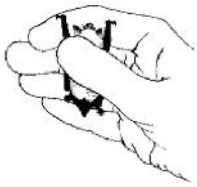
Check list

First aid	
Contain the bat	✔
Examination	✔
Keep a record	✔
Rehydration	✔
Feeding	✔

First aid – the aim is to cause no harm

- Containing the bat
  - ✔ A bat in need of attention should be retained in a small secure container with sufficient air holes.
  - ✔ Handling of the bat should not be necessary.
  - ✔ With a clean cloth or tea-towel, cover the bat and gently transfer the whole thing into a secure box.
  - ✔ Using a cloth minimises the stress to the bat, removes any risk to the handler and provides the bat with a safe place to hide until it decides to investigate the container.
  - ✔ Every bat should be kept in isolation unless casualties are obviously from the same colony.
  - ✔ A small, very shallow clean container with a few drops of water placed in the box will provide an opportunity for the bat to drink. Please note that this should be removed during transport. Alternatively kitchen roll placed in the shallow container will avoid spillage or drowning whilst providing a continued source of water.

- Handling and examination of bat
  - ✔ How to hold:
    - A bat should NEVER be handled by its wings during the course of examination,
    - Bats feel safe in a crevice so mimicking this with your hand can help the bat feel secure,
    - Placing a soft cloth over the bat's head during handling and examination can calm the bat and avoid additional stress.



  - ✔ How to examine:
    - Observe the bat in its container before picking it up – how it moves, sits/hangs, any obvious injuries that can be seen, any staining in the urine and unusual droppings. This will minimise the stress of examination,
    - Use a systematic approach to examination beginning with the head, examining both above and underneath the body,
    - Gently extend the wings downwards (as shown in the photo opposite),
    - Information on examining bats is given in BSAVA Manual of Wildlife Casualties and in the Bat Rescue Manual.

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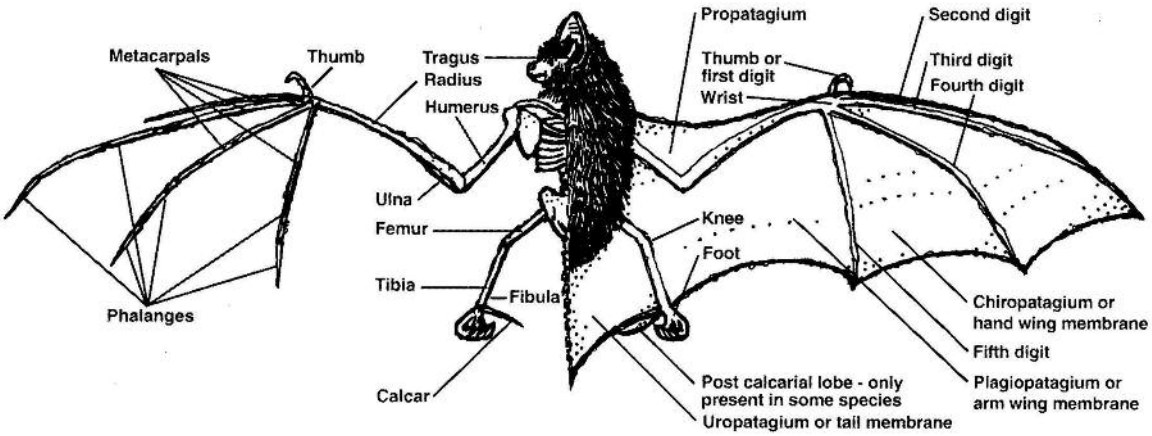
Correct way to examine the wing of a bat

  - ✔ Look for:
    - Fractures, holes, tears or bleeds in the membrane,
    - Foreign bodies,
    - Dullness of the membrane caused by dehydration or dust,
    - Ectoparasites,
    - Ulceration and/or stickiness or contamination of the membrane,
    - Ossification of the bones to help estimate age (in a growing bat, all, or part of, the fingers in the wing are cartilage whereas in an adult bat they are bone. Light, when shone through the wing, will transmit through the cartilage and it will appear clear to the observer). Please refer to the Bat Rescue Manual for more information,
    - Unusual or abnormal movement, for example, the bat constantly moves only to its left or its right,
    - Trauma to the eyes/ears/mouth, and/or other parts of the body,
    - Entanglement,
    - Condition of bat – e.g. pregnant, undernourished, etc.



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- ✔ A diagram showing a bat's anatomical features (like the one shown here) should be used by rehabilitators as a guide when examining a bat. This will further a rehabilitator's understanding and highlight any abnormalities which will need further attention.

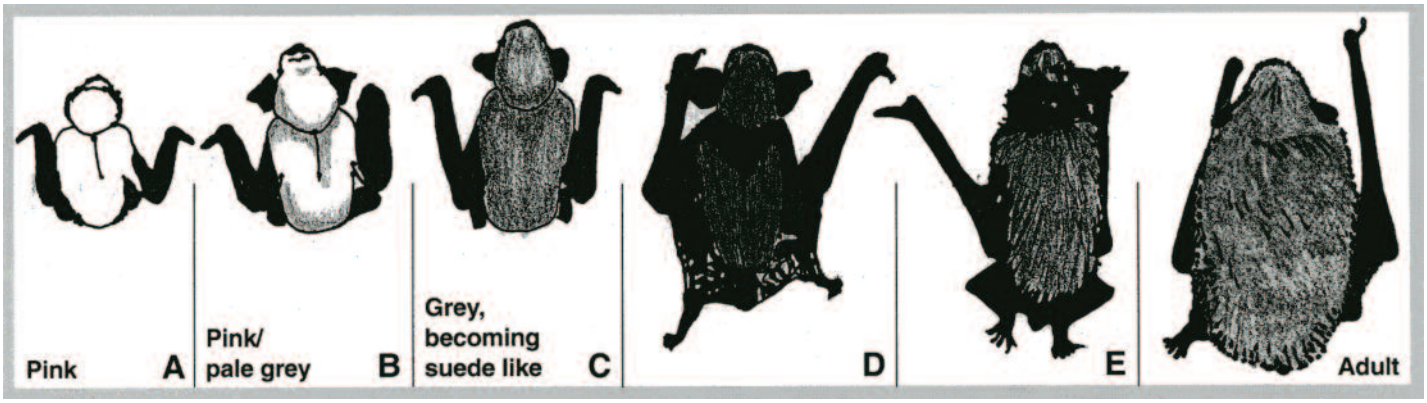
❍ Rehydration

Almost every bat that comes into care will need rehydration, food and rest before being released back into the wild. Dehydration should be a primary concern; very often a bat will not want, or be able, to eat until it is rehydrated. In addition a torpid bat will need to be warmed up gently before it can eat or drink.

- ✔ Water given little and often may be enough to address dehydration.
- ✔ In more serious cases rehydration support liquids given by mouth and designed for small animals, for example Royal Canin Rehydration Support sachets, are effective.
- ✔ Subcutaneous rehydration methods are not considered appropriate for British bat species.

❍ Baby bats – how to tell if it's a baby...

- ✔ It is essential to be able to identify a baby or juvenile bat as soon as possible as treatment for these individuals will differ.
- ✔ All UK bats are very small but a baby or juvenile will have no or little fur on its body.
- ✔ Blow gently on the bat's fur – if it does not part easily it is likely to be a young bat. The diagram here provides an indication of a bat's growth stages from newborn to fully grown adult.
- ✔ If the bones are not yet ossified, please refer to the BSAVA Guidelines for further information.
- ✔ If the bat is identified as a baby please refer to Baby bats for further information.



© Maggie Brown

❍ Check list

It is essential to record as much information as possible about each bat; this is necessary for legislation and licensing regulations (see Legislation, licensing, equipment and expertise section) but is also important for the continued treatment and care of the bat as well as the eventual release.

You should record:

- ✔ Reason for taking a bat into captivity.
  - ◆ This may be for observation, treatment, or to keep safe until an appropriate release time.
- ✔ Contact details of finder.
  - ◆ Very often the discovery of a bat by a member of the public indicates the presence of a roost nearby. The finder will also be able to provide any additional information needed about the bat's discovery which may help with the diagnosis and treatment of the animal.
- ✔ Signature from the finder – to show that they have passed the animal into your care.
- ✔ Details of anyone who has handled the bat – has anyone been bitten or scratched? (see Health and safety).
- ✔ Circumstances in which the bat was found.
  - ◆ This may provide information that will aid in the diagnosis of the bat's ailment. It will also be useful to gather information that could suggest an illegal activity relating to a protected species.
- ✔ Exact place where the bat was found.

- ✔ The presence of nearby bat roosts.
- ✔ Identification of species.
- ✔ Weight and forearm measurement of bat.
- ✔ Age, sex and breeding status of individual – care and treatment may vary depending on the individual being dealt with – it is particularly important to identify as soon as possible if the individual is a baby (See Baby bat section).
- ✔ Initial assessment – is there any obvious damage, bleeding, etc?

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Date of Registration _____ **Reference** ☐

Release ☐ **Permanent Captive** ☐ **Ring No** ☐

DoA ☐ **Died** ☐ **Euthanased** ☐ **APHA** ☐

BAT RESCUE REGISTER

Use in conjunction with BCT's Good Practice Guidelines. Use continuation sheet BRR2

THE FINDER

Found by _____ Date _____ Approximate time _____

Address _____

_____ Post code _____ Phone number _____

Collected/delivered by (if different from above) _____

Address _____

_____ Post code _____ Phone number _____

Bat found at _____ Grid reference or post code _____

Details _____

_____

_____ Roost ☐ Known ☐ Grid ref _____

Water given by finder _____ Any feeding by finder _____

_____

Any other information _____

_____

_____

Passed on for care by (signature) _____

Has anyone been bitten? Yes ☐ No ☐

If 'Yes' refer to BCT guidelines

THE BAT

Reason for Captivity

- ☐ Injured
- ☐ Adult - No apparent injury but flightless
- ☐ Baby - development stage _____
- ☐ Juvenile - ☐ Not yet flying
- ☐ Other _____

Details of Bat

Species _____

☐ Male ☐ Female ☐ Lactating ☐ Juvenile

Distinguishing marks (other than injuries)

_____

_____

Right Forearm length _____ mm

Weight on admission _____ gms

Check List

- ☐ A Urine (staining / blood)
- ☐ B Droppings (presence / consistency / blood)
- ☐ C Bones
- ☐ D Membranes (inc. tail & pre elbow)
- ☐ E Flesh wounds (blow through fur)
- ☐ F Head / eyes / ears / jaw
- ☐ G Ectoparasites (rec. brief details)
- ☐ H Poison / pollutants / adhesives
- ☐ I Temperament
- ☐ Cat involved

Brief description of injuries and cause (if known)

_____

_____

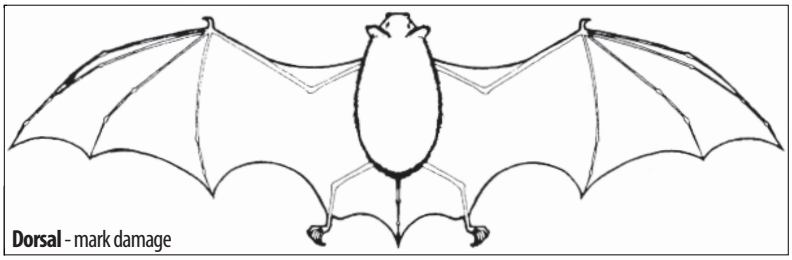
_____

_____

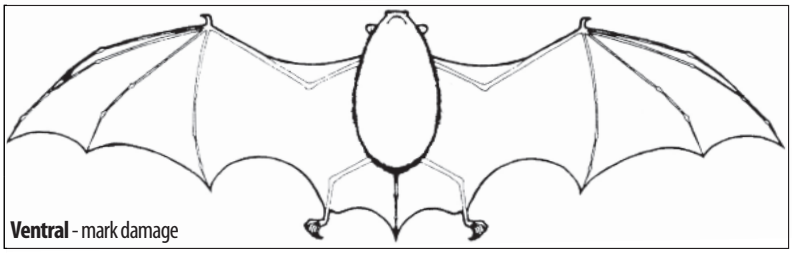
_____

_____

Injuries please mark on chart



Dorsal - mark damage



Ventral - mark damage

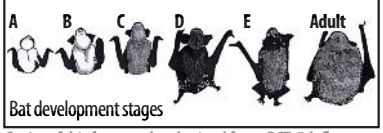
Initial examination. Date _____ Time _____ Who by _____

Action taken _____

_____

RETURN OF BABY/JUVENILE TO ROOST

	Date	Time	Result
1			
2			



Bat development stages

TREATMENT

Full examination. Date _____ Time _____ Who by _____

Details _____

_____

_____

- ☐ Vet required _____
- ☐ Antibiotics required _____
- ☐ Surgery required _____

_____

_____ Follow up care on continuation sheet BRR2

Copies of this form can be obtained from: BCT, 5th floor, Quadrant House, 250 Kennington Lane, London, SE11 5RD

Design - Bat Care Mews

Ailments and treatment

This chapter aims to cover the most common ailments associated with bat care. **Advice from a vet is required in all situations where surgical procedures or medicines may be necessary.** Rehabilitators should always consult with a vet for diagnosis and treatment. Good working relationships between rehabilitators and vets are essential.

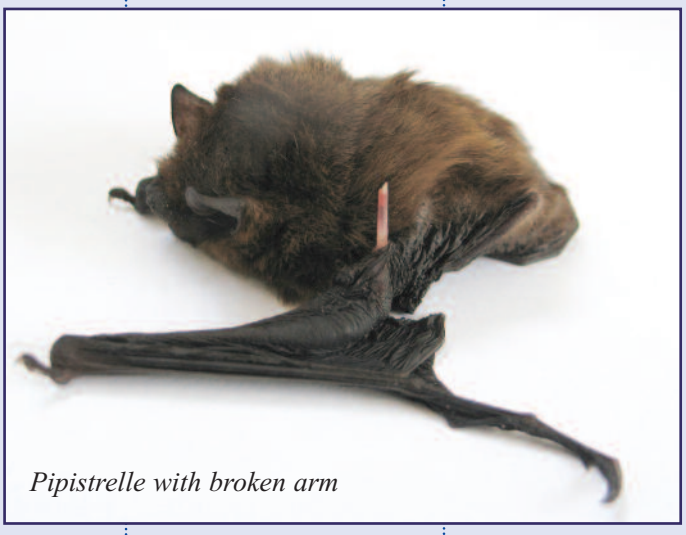
Detailed information about medication and dosages are covered in a further section (Medicines).

This information is taken from the BSAVA Manual of Wildlife Casualties and the Bat Rescue Manual – please refer to these publications for further discussion of these ailments and their treatment.

For all treatment decisions, overall considerations should be given to:

- Ethics,
- The level of damage,
- Number of afflictions affecting the bat,
- Condition of the bat (grooming, feeding, drinking ability),
- Distress level,
- Euthanasia.

Ailment	Cause/info	Treatment options	Considerations
Fractures	• Can be caused by cat attacks, collision with objects, etc. • Cat encounter injuries may also include internal damage and are often accompanied by piercing wounds and pinholes in the membrane. • Cat injuries are also associated with septicaemia and related issues.	• For major bone fractures euthanasia should be considered. Bats have evolved to fly. Very careful consideration of quality of life should be given to bats deprived of this basic but critical function (see Legislation-Animal Welfare Act). • Intramedullary pins or internal fixators (with antibiotic cover) for forearm bones in larger species. • For minor wing-tip and distal phalange injuries – tidy up with removal of non-viable tissue – through careful dissection under general anaesthesia. • Pain management.	• Is it a simple or compound fracture? The prognosis for compound fractures being much poorer. • Will it regain full mobility? • Substantial fracture repairs carry poor prognosis for release. • Surgical procedures (pinning) require a certain amount of veterinary experience and skill to be successful and are only appropriate for the longer forearm bone. • Other than minor amputations of the tips of bones in the wing, no amputee would be fit for release. Amputation can also cause problems with grooming, mobility and roosting and may cause stress through phantom appendages and is not therefore recommended. • Simple fractures may heal if restricted but care is needed because of the delicate wing membrane. Bats are inclined to remove anything attached to the membrane causing complications. • Juvenile bats heal more quickly than adult bats. • Finger bones have more chance of healing sufficiently for release. Bats have been observed in the wild with naturally healed finger bones.



Pipistrelle with broken arm

© Gail Armstrong

Ailment	Cause/info	Treatment options	Considerations
Holes and tears  © Bryan Brown *Hole in wing*	• A hole injury is defined as a hole where the wing margin remains intact. • A tear is defined as a rip that extends through the edge of the membrane. • Holes and tears are mostly caused by cat attacks. • Bats may also have old holes that do not inhibit flight.	• Antibiotics may be necessary if damage is cat-related. • Holes and rips in the membranes mostly heal naturally while in care.	• Are there any other injuries (e.g. fractures or dislocations) that need to be addressed? • Small holes heal very quickly. Larger holes and tears require longer rehabilitation with flight facilities. The bat may need to be passed to a carer with appropriate facilities. • Tears: If with gentle manipulation the membrane appears to be 'complete' (the sides match up) healing is more likely. • If the tear is alongside the finger bone (often the fifth finger) it is likely to heal but if the finger bone is completely de-gloved (exposed) infection is likely and the prognosis is poor. If part of the finger bone has been amputated (particularly, for example, below the last knuckle of the fifth finger) the membrane may heal but loss of further bone may limit flight. • With large tears, the resultant scar tissue/contraction of the wing may preclude perfect flight. • There is ongoing research in this area – consult experienced bat carers or contact BCT for further updates.
Puncture wounds ◆**Skin punctures** ◆**Subcutaneous emphysema**	• Mostly cat damage.	• Antibiotics for cat damage. • Deflation of subcutaneous emphysema with a small sterile hypodermic needle and provision of antibiotic cover. • Confine the bat to restrict movement temporarily while healing.	• Depth and site of puncture. • Possibility of invisible internal injuries. • Inflation may reoccur. • Occult injuries should be considered if the bat appears moribund and its condition does not improve with first aid.
Spinal trauma/ fracture, including fractured tail	• Cat damage, trauma from collision. • Unable to use hind limbs, unable to hang, or grip with/move toes. Large bladder as unable to urinate.	• Veterinary confirmation required, euthanasia if confirmed.	• Depending where a tail is fractured it may exhibit similar symptoms to spinal trauma. • Tail ends often heal – check flight ability.

Wing repair observed over a four month period

Wing tear 9th May

Wing tear 26th June

Wing tear 3rd August

Wing tear 14th September

Photos © Wendy Northrop

A bat removed from fly paper using edible oil, the same bat after washing off surplus oil and drying

© Gail Armstrong

Ailment	Cause/info	Treatment options	Considerations
Foreign bodies ◆ **Fish hooks** ◆ **Thorns/splinters**	• Fish hooks are most associated with bats that feed close to the water, which are thought to confuse the hooks with insect prey when feeding over the water.	• Disentanglement may require general anaesthetic. • Remove thorns or splinters. • Cleaning with antiseptic. • Antibiotics may be required.	• Depth of hook injury, depending on whether the hook is taken in the mouth or caught in wing or tail membrane. • Circulatory impairment. • Increased risk of bat being a Daubenton's bat if found near water. Advise vets/handlers of higher rabies risk (see H&S>EBLV).
Contamination ◆ **Dust/powder** ◆ **Gooey stuff** ◆ **Oil** ◆ **Fly paper** ◆ **Polyurethane foam** ◆ **'Bird free' gels** ◆ **Hot tar/bitumen on flat roofs**	• If necessary advise that the contaminant is covered to prevent further casualties – for example open containers of flour, industrial powders and adhesives, drip trays of engine oil, cockroach traps and fly papers.	• Rehydrate, if possible, as a first aid measure, the bat may have been trapped for days. If there is obvious damage to bones or severe emaciation consider whether euthanasia is appropriate before treatment. • Dust or powder can be brushed off using a fine paintbrush. Greasy powders like soot also need washing off with soap or mild detergent. • Water-soluble contaminants (including modern fly papers) should be washed off with water; stubborn substances can be washed off with mild soap or detergent solutions, which must then be washed off with clean water. Apply only to affected areas using a fine paintbrush or make up sponge. Rinse with an atomiser spray. Do not rub, and put bat onto absorbent material in a container with a heat mat or in a warm place to dry. • Oil-based contaminants can be removed with butter, vegetable oil or margarine, then mild soap or detergent to remove grease, and clean water to remove the detergent/soap. A small atomiser with soapy water and a second with clean water can be used to 'shower' the bat. If bathing, have two bowls ready before starting and avoid getting too much water on top of the wings to prevent damage to the delicate bones. Dry as above. • Fly paper – cut away as much of the paper as possible to avoid further sticking and stress. If there is a risk of cutting the bat then de-tack the sticky areas by applying paper or tissue. Water, margarine, butter, olive oil, or milk can then be used to remove the stickiness (test a small area first) – wash grease off as above.	• Successful treatment requires patience, time and experience of handling bats. Serious cases should only be attempted in conjunction with an experienced bat carer, however release after treatment is possible. • Consider contacting the manufacturer's helpline to discover what is in the product and the best way to remove it, particularly with new products. Increasingly fly papers are based on water based adhesives – test small area with water first. • Solvents that are conventionally used for removing sticky and oily substances may be toxic to bats, and may cause severe heat loss through evaporation. • Veterinary sprays for removing sticky materials are not advised because of heat loss by evaporation over a large surface area. • Warm, not hot water should be used where necessary. • There may be hair loss. Bats moult in the summer and hair will probably not be replaced until the next moult. • There may be holes or tears in the wing and tail membranes as a result of the bat pulling away from sticky surfaces (see above). • Material ingested by grooming may have effects.

© Bryan Brown

Bat on flypaper

Ailment	Cause/info	Treatment options	Considerations
		• Polyurethene foam is likely to be dry by the time the bat is found. It can be removed carefully using fine tweezers, scalpel and fine scissors.	
Ectoparasites ◆**Mites** ◆**Fleas** ◆**Flies** ◆**Bat bugs (Cimex)** ◆**Ticks** ◆**Spinturnid mites** ◆**Maggots/ Flystrike**	• Expect a few mites and occasional fleas. Ticks and bat bugs (Cimex) are found less commonly on bats. • Identify the type of ectoparasite: Mite, flea, fly (bat flies are tiny wingless flies that look like mites to the naked eye), spinturnid mite (crab like on wing membranes in Myotis and Nyctalus bats), bat bug (Cimex) or tick. Treat according to recommended method of removal. • Very young (hairless) bats with an excessive (dozens or more) load of parasites and badly emaciated may be orphaned/abandoned and are not likely to thrive.	• Physically remove excessive fleas, bat flies, mites, and bat bugs (Cimex) but not ticks, with a damp fine paintbrush or tweezers. • Change paper and cloths in cages every day until number of parasites reduces. • Ticks attach themselves to the bat with barbed mouthparts. The bat may remove the odd one but occasionally there can be large numbers. A small amount of Frontline spray (available from vets) can be applied (adults only). Spray into a small container and then apply a small amount with a fine paintbrush to the nape of the neck or directly on to the tick. • Spinturnid mites on the wing membrane (like little crabs) are difficult to brush off but can be lifted off with micropore tape, taking care not to damage the membrane. • Maggots suggest a severely debilitated bat which may require euthanasia. They can be removed with tweezers or rinsed out with water with a little mild detergent.	• Is the bat ill or injured and unable to groom? • Ticks can carry babesia from bat to bat. • Maggots suggest bats have been debilitated for some time and when found are usually in/on open wounds and in the genital area. They are not found on healthy bats.
Other skin/membrane problems ◆**Minor wounds** ◆**Sticky wing** ◆**Fur loss** ◆**Burns**	• Minor wounds, for example where the membrane is damaged only on the inside of the wing, can cause the membrane to stick together. • Poor husbandry and inadequate ventilation can cause 'sticky wing' in long term captives. It can also be caused when an injury prevents bats from opening the wing properly to groom. • Intradermal parasites, for example Psorergatoides species, can cause deterioration of the wing membrane. Demodex has also been diagnosed once in a bat.	• Keep cage clean and dry, consider antibiotic treatment for minor wounds. • Address poor husbandry by preventing cage and contents getting damp and improve ventilation. Keep the cage in an area of high humidity. Severe cases of sticky wing can be rinsed in tepid slightly salted water. • Endoparasites in skin require veterinary diagnosis and treatment. • For localised fur loss, look for ticks, otherwise consider diet. • Fur loss down the belly and under the chin can be avoided by preventing mealworm innards or milk from dribbling down. Bats that secure mealworms against their chests should be offered smaller (mini) mealworms.	• Fur regrows after the annual moult in most cases. Hair loss from poor nutrition in long term care may mean that the new hair does not grow.

Ailment	Cause/info	Treatment options	Considerations
	• Localised fur loss can be caused by excessive scratching or poor nutrition. • Fur loss under the chin and down the belly can be caused by food soiling. • Fur loss on the lower belly may be caused by incontinence. • Bats coming down chimneys onto stoves, 'hugging' light bulbs, or in contact with caustic chemicals may suffer burns that are not immediately apparent.	• For burns, rehydration, analgesia and possibly antibiotics. Blood supply to the membranes may be damaged and the membrane crisps and dies. Close monitoring for approximately ten days to see the full extent of wing and tail damage. Extensive damage suggests euthanasia. Smoke damage may also cause respiratory distress. *Possible burn to wing membranes*  © Wendy Northrop	
Diarrhoea	• Could be manifestation of minimal gut contents following starvation. • Over feeding.	• To treat diarrhoea – oral fluids should be used primarily to address dehydration. See Rescue and collection>Rehydration. • Make sure the bat is warm and able to swallow. Give water every 20 to 30 minutes, gradually increasing to every two hours until bat is much brighter. • Control food intake if over feeding is suspected.	
Starvation/ refusing food  © Bryan Brown *Feeding bat with paintbrush*		• Rehydration should be initiated before trying to give the bat food. Make sure the bat is warm and able to swallow. Give water in small amounts, very frequently (every 20 to 30 minutes, increasing to every two hours) until bat is much brighter. • Then use liquid food, for example diluted mealworm insides or diluted Hill's AD, from a small clean paintbrush or small syringe. • Progress to mini or regular mealworms depending on the size/species of bat. Occasional waxworms can be given for extra calories.	• The cause of the problem – are there underlying factors that have prevented the bat from feeding, for example a broken jaw or damaged tongue? • Is the bat warm? • Bats disturbed in hibernation, which cannot be released immediately, frequently refuse food and want to return to torpor – check their body condition. • When bats begin to take whole mealworms after being undernourished they can eat very slowly, have patience!
Poisoning	• Poisoning is very rare in bats. • Normally associated with remedial work to properties, i.e. timber treatment. • Most treatments now used are considered to have low mammalian toxicity.	• Smell the bat during examination to identify possible chemical exposure.	• Rehabilitators should seek further advice in situations where bats that have no obvious symptoms do not improve during observation; rather than assuming they could be poisoned.

Ailment	Cause/info	Treatment options	Considerations
Rabies	• Rabies symptoms can vary depending on an individual or species but may involve some of the following: the bat may be agitated, aggressive, roost alone, reluctant to eat or groom, suffer from spasms or fits.	• Any bat displaying symptoms that could suggest rabies must be isolated immediately and handling kept to a minimum. Do not euthanase until further advice is obtained. • Please contact BCT immediately if a bat in your care is displaying any abnormal symptoms.	• Species of bat: the behaviour of some species and some individuals is more agitated and aggressive when taken into care, if in doubt contact BCT. Daubenton's bats are normally placid but are the species most likely to show symptoms of rabies. Arching of wings and 'playing dead' are two occasional but normal behaviours of individual bats.
White-nose syndrome	• Caused by *Pseudogymnoascus destructans* (Pd) a fungus that thrives in cold damp conditions like caves.	• See BCT WNS guidelines for bat carers or contact BCT if fungal infections are identified in examination, for example, bats with a white fungus particularly around the nose, but also on the wings, ears and/or tail.	• The fungus (Pd) has been confirmed in the UK. There is however no evidence of the syndrome observed to date. See H&S>White-nose syndrome

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Long-eared bat eating a mealworm

Medicines – to be used by, or in conjunction with, a vet

Please note that Prescription Only Medicines (POM) and Prescription Only Medicine - Veterinarian (POM-V) for animals can only be prescribed by veterinarians for animals **in their care.**

- Anaesthesia
  - ✔ General anaesthesia can be undertaken using the volatile agents halothane or isoflurane for both induction and maintenance. These are delivered through oxygen and nitrous oxide/oxygen mixtures.
  - ✔ Neither local anaesthetic agents nor injectable general anaesthetic agents can be advocated.

- Analgesia
  - ✔ Meloxicam (e.g. Metacam Oral suspension).
    - ◆ Contraindicated in dehydrated, pregnant or lactating individuals.

- Antibiotics
  - ✔ There are no antibiotics specifically licensed for use in bats; however they have been used to good effect. The use of antibiotics should be very carefully considered and only used according to need.
  - ✔ All antibiotics should be given orally.
  - ✔ The small size of the bat and the potential for the bat to go into torpor should be taken into account.
  - ✔ Doses should be calculated for body mass and should be given to bats while warm and active. These products could be toxic to bats in torpor because of their changed metabolism; therefore bats should be kept warm during and after treatment until all of the drug has been excreted.
  - ✔ The table below provides information on antibiotics that have been used in UK bats:

Antibiotic name	UK brand names	Contra indications
Amoxicillin /clavulanic acid	Clavamox drops Synulox palatable drops	
Enrofloxacin	Baytril	Not for pregnant, lactating bats or growing bats

- Ectoparasiticides
  - ✔ Small numbers of ectoparasites can be removed with a fine damp paintbrush.
  - ✔ Heavy loads of ticks (*Argas vespertilionis*) can be treated with POM-V Frontline spray. Do not spray directly onto the bat, spray into a dish and use a fine paintbrush to apply to the nape of the neck or directly on to the ticks. This is available through vets.

  - ✔ For further information; Bexton & Cooper (2010) and BSAVA Manual of Wildlife Casualties (2016) (see Further information, support and references).

Euthanasia (how to)

Method of euthanasia

- ✔ Consult (with a vet) if unsure or inexperienced. A vet should be able to euthanise a bat where a bat rehabilitator is not happy or confident to carry out this procedure for themselves.
- ✔ Dislocation of the cervical vertebrae is the most humane and efficient method of euthanasia. With the bat placed on a hard surface a strong, stiff rod is used and pressure is applied to the bat's neck.
- ✔ Alternatively the bat can be given a lethal injection, normally an overdose of an anaesthetic agent. Please note that this method requires expertise, as well as the use of a POM-V drug, and should only be used by a vet or trained lay person under veterinary guidance.

Dead bats

- ✔ Dead bats should be sent to the Animal and Plant Health Agency (APHA) for inclusion in their passive surveillance programme for EBLV. See Health and safety for more information on EBLV.
- ✔ APHA are no longer testing pipistrelle bats unless they have been involved in a contact incident (e.g. they have bitten or scratched someone or been in contact with a pet). All other bat species should still be sent, along with those where there is any doubt over the species identification and individuals of any species which have been involved with a contact incident.
- ✔ Tubes and address labels can be obtained from BCT or APHA (see Further information, support and references).

© Wendy Northrop

Bat with extensive wing damage

©BCT

Passive surveillance programme pack

Care and conditions

Check list

Care and conditions	
Housing	✔
Temperature	✔
Feeding	✔
Exercise	✔
Continued assessment	✔
Hibernation	✔

- Housing – general considerations
  - ✔ Must be possible to clean and sterilise the container.
  - ✔ Possible housing to use includes plastic pet containers and reptariums.
  - ✔ For short-term care small plastic faunariums are the most readily available, secure and easy to clean.
  - ✔ Needs to be escape proof.
  - ✔ Choices for roosting/natural behaviour should be considered – especially for long-term and permanent captives.
  - ✔ Plastic/glass cages may need lining to allow bats to grip better.
  - ✔ The container should have dark areas where the bat can conceal itself and should have materials (for example, cloth) from which the bat can hang.
  - ✔ If housing more than one bat in the same container there should be provision for private areas such as individual pouches so that each bat can have their own space. (See Health and Safety>Isolation and Care and Conditions>Long-term/permanent captives for more information about keeping bats together).

- Housing – size considerations
  - ✔ As a general rule the size of the cage should be twice the length of the bat's wingspan. Recommended size of 40 x 25 x 25cm for a small bat species and 46 x 30 x17cm for a large bat species.
  - ✔ Considerations:
    - Does the bat have access to additional space, for example, flight cages?
    - Would the bat's recovery process benefit from a larger/smaller sized cage? For example for some wing injuries a smaller cage to restrict movement to wing stretches only may be beneficial.
    - A bat should be able to fully stretch its wings,
    - Is the cage for transportation, short-term care, long-term care, etc?
  - ✔ A rehabilitator should aim for the largest available space for longer-term captives so that they have the space and the option to fly if possible.
  - ✔ The containers used to house bats will depend upon:
    - The available resources of the rehabilitator,
    - The needs of the individual bat,
    - The additional space available to the bat.
  - ✔ A rehabilitator should be able to justify the conditions in which the bat is being kept.
  - ✔ The bat's cage requirements should be assessed on a daily basis.

- Temperature
  - ✔ The following considerations should be taken into account:
    - The time of year in relation to the bat's life cycle, for example, a bat in care during the summer season will have different requirements to a bat discovered during the winter time when bats will normally be hibernating. Please note, however, that this does not include sick/injured bats,
    - The bat's injury – an external heat source can be an invaluable tool for very sick bats and will aid recovery,
    - Adult/juvenile/baby – An external heat source helps very young babies to maintain their body temperature and digest their food.
  - ✔ The heat source should be located at one end of the housing; this will then provide a heat gradient giving the bat an opportunity to move towards or away from the heat depending on its needs.

Feeding

Food sources

- ✔ In the wild, UK bats feed on insects, normally taken on the wing. This is not possible for bats brought into care and as such, alternative food sources are used.
- ✔ Live mealworms are the primary food given to captive bats and can be purchased from an exotic pet shop or online supplier.
- ✔ A small amount of tinned cat or dog food has been used by some individuals in an emergency. The pet food should be mixed with water to make a paste (and offered on the end of a teaspoon or a small, clean paintbrush).
- ✔ Mealworms are obtained for bats spending more than a day in care.
- ✔ Bats in care will not be familiar with alternative foods such as protein pastes or dog/cat food and will need to be fed initially (i.e. food put into their mouth).

How to feed

- ✔ For new casualties (who will be unfamiliar with this food type) the mealworm should be decapitated and the insides squeezed out into the bat's mouth (see H&S>Mealworm allergies).
- ✔ Gradually the bat can be offered the whole mealworm (still with the head removed) and then eventually mealworms can be left in a shallow dish in the bat's enclosure. Please note that live mealworms should not be left in a cage with young or very ill/weak bats or those with open wounds as the mealworms will graze on the bats.
- ✔ Bats need to be warm and active to take food and keeping the bat warm during feeding will help aid digestion and speed up recovery.
- ✔ Water should be available to the bat at all times in a small, very shallow, container. This should be replenished on a regular basis.

For information on baby bats please refer to the Baby bats section

© Peter Crome

How to feed

Nutritional value

- ✔ Although the use of mealworms for short-term care is acceptable, this food type is nutritionally deficient and must be supplemented with other sources for the diet of long-term captives. Please consult the Bat Rescue Manual for more information.

Pregnant bats

- ✔ It is important to be aware that female bats brought into care during the hibernation period, kept in warm temperatures and fed ad lib may give birth unseasonably early – depending on treatment this may be unavoidable.
- ✔ Early in the season it can be difficult to identify pregnancy. It is therefore important to consider that any adult female bat in care could be pregnant and treat accordingly.
- ✔ Certain medicines may not be suitable for pregnant bats – this should be discussed with a vet.
- ✔ Baby bats are usually born in June – extra awareness of the possibility of pregnant bats around this time is required.

Exercise (equipment for)

- ✔ Housing
  - ◆ Appropriate space should be offered so that casualties can fully open their wings and move around if they want to.
- ✔ Flight cages
  - ◆ A designated space or flight cage should be used to test fly all releasable bats. See Rehab and release and Flight cages.

Continued assessment

- ✔ Throughout the course of the rehabilitation/captivity period the bat should be carefully monitored on a daily basis to assess the bat's progress and monitor the bat's welfare needs.
- ✔ Weight – many bats will arrive into care very underweight and suffering from starvation. A record should be kept of the bat's weight and/or condition and compared against normal weights for that species for the time of year.

UK species weights and forearm measurements (Dietz *et al* 2009)

Species	Forearm (mm)	Weight (g)
Greater horseshoe bat	53.0 – 62.4	18 – 24
Lesser horseshoe bat	36.1 – 39.6	4 – 7
Daubenton's bat	33.1 – 42.0	6 – 10
Brandt's bat	33.0 – 38.2	5 – 7
Whiskered bat	32.0 – 36.5	4 – 7
Alcathoe bat	30.8 – 34.6	3.5 – 5.5
Natterer's bat	34.4 – 44.0	7 – 10
Bechstein's bat	39.0 – 47.1	7 – 10
Noctule	47.3 – 58.9	21 – 30
Leisler's bat	38.0 – 47.1	13 – 18
Common pipistrelle	28.0 – 34.5	3 – 7
Soprano pipistrelle	27.7 – 32.3	4 – 7
Nathusius' pipistrelle	32.2 – 37.1	6 – 10
Serotine	48.0 – 58.0	18 – 25
Barbastelle	36.5 – 43.5	7 – 10
Brown long-eared bat	35.5 – 42.8	6 – 9
Grey long-eared bat	36.5 – 43.5	6 - 10

- ✔ The bat's food intake should also be monitored; taking into account the appetites of different bats, a bat that does not have or develop an appetite may provide clues to other injuries that were not initially obvious.
- ✔ The condition of the bat's coat, wings, etc will also give a good indication of the fitness of the bat and how the individual is reacting to both treatment and captivity.

Long-term/permanent captives

- ✔ All care of permanent captives should be underpinned by the ethical considerations (see Ethics section)
- ✔ It is essential to consider the following for any long-term captives:
  - Opportunities for natural behaviour must be provided – bats are nocturnal creatures and will require places to hide and hang during daylight hours,
  - Bats are social animals and in the wild female bats will generally roost together during the summer breeding season – permanent captives of the same species (and sex) can be housed together. This should however only be undertaken following a bat's isolation for at least six months (see Health and safety section for context). Consideration should also be given to the natural temperament of the individuals and the available space in the cage. Male and female bats should not be placed together,
  - Captive bats should only be kept if they can be used for education – the frequency of use should be based upon the welfare considerations of the bat,
  - At all times the welfare of the bat must be a priority.
- ✔ For detailed information on the care of long-term captive bats please consult the Bat Rescue Manual.

Hibernation

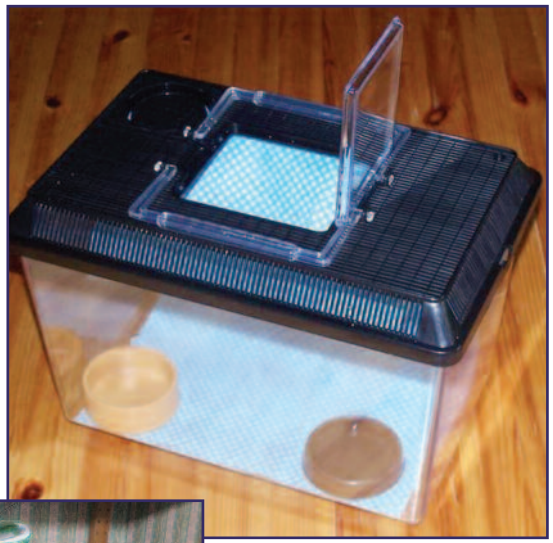
- ✔ Where possible any bats suitable for release should be released back into the wild as soon as possible to avoid over-wintering. In the UK bats hibernate during the winter period and retaining a bat in captivity in this time could cause other problems such as early pregnancy in females.
- ✔ Short-term casualties can be considered for release in the hibernation period in winter, as long as they are healthy and of a good weight, and the other conditions for release are met (see Rehab and release section).
- ✔ Cages should be in shaded natural light, with roosting places where bats can hide away. If this is done most bats will slow down to half or less of their normal activity in winter and some will hibernate completely for several months.
- ✔ Providing both water and food will allow bats the opportunity to feed and drink if required.

Rehab and release

Rehab

Check list	
Can the bat...	
Fly	✔
Echolocate	✔
Feed	✔
Groom	✔

- Flight
  - ✔ In many cases a grounded or dehydrated adult bat should show signs of being able to fly within 48 hours. If it does not then other injuries are likely.
  - ✔ A bat in care will need to gradually build up its strength and stamina.
  - ✔ All releasable individuals should be given the opportunity to fly once their injuries are healed.
  - ✔ The bat should be observed for signs of readiness to fly, young bats in particular will start to flap and stretch their wings.
  - ✔ A healthy bat should be able to achieve 10 to 15 minutes of continuous flight.
  - ✔ The bat should have no obvious problems with manoeuvring or navigation.
  - ✔ A bat should be able to maintain and increase height after take off. The individual should be tested in a flight cage or designated area.
- Echolocation
  - ✔ Using a simple heterodyne bat detector the bat should be monitored in flight to check that it is echolocating.
  - ✔ The bat's flight should also be observed to confirm that the bat is able to navigate objects.
- Feeding
  - ✔ The bat must be able to feed itself.
  - ✔ The bat should show an instinct to catch live prey. For individuals in care over short periods of time – this should not be a problem. Longer-term casualties and young bats will require more help to ensure they will be able to hunt and catch their own food.
  - ✔ The bat's progress should be monitored through droppings (consistency/shape, and dissection if feeding on flying insects) and weight.
- Grooming
  - ✔ A healthy bat, ready for release, will groom itself regularly – an individual that does not appear to do this may have trouble grooming because of an external injury. It may also indicate underlying internal injuries that would otherwise be difficult to detect.



© Maggie Brown

Short-term care housing

© Gail Armstrong

Bat hospital

Release

Check list

Release	
Location	✔
Timing	✔
Weather conditions	✔
Height	✔

Any bat ready for release should have satisfied the criteria set out in the Rehab section. All bats should be test flown and where necessary given extra flight practice prior to release.

- Release location
  - ✔ It is extremely important that a bat is released where it was originally found, or as close to this location as possible, unless there is a problem with the site.
  - ✔ Bats are loyal to their roosts and thus it is important, where possible, to release them back into a familiar area.

- Consider the environment that the bat is being released into
  - ✔ Are there roosting opportunities available? In cases of long-term bats being released, the environment may have changed significantly and this should be investigated prior to release.
  - ✔ If the bat is from a known roost, the site should be checked to confirm that the colony is still using the area – this is more important for juveniles.
  - ✔ Do extra provisions for roosting need to be made?
  - ✔ Where a bat's roost has been lost and the bat has been in care for a long period of time, the individual may benefit from being released from a 'familiar' artificial roost, for example a bat box that it has roosted in and can access easily, in or close to the place of finding.
  - ✔ Is there any chance that the released bat will carry infection into the local population? (This is less likely if isolation and good hygiene have been used).
  - ✔ Not enough is known about territorial behaviour and population densities of many species of bats. Bats are colonial creatures and releasing them within the location of their own colony will minimise problems. If a bat is released into a new site, (because the original site is unknown or very unsuitable) consideration should be made of the type of eco-system/habitat the species normally inhabits. Additionally the bat should have no appearance of infectious disease that it might introduce to the wild population.

- How to release – timing
  - ✔ Bats are nocturnal creatures and emerge from their roosting sites at dusk. The bat should be released at dusk time so that it can orientate itself properly and avoid daytime predators that it would not normally come into contact with.

- How to release – weather conditions
  - ✔ Where possible very cold, windy or rainy evenings should be avoided as these conditions are less favourable to bats generally and a successful release is less likely in these conditions.

- How to release – height
  - ✔ In their natural environment bats will normally take off from a height, dropping and swooping before flying off towards their foraging grounds.
  - ✔ This can be from a high structure like a wall or window ledge, or a gloved hand.
  - ✔ The bat will warm itself up and survey the surroundings before flying off. The release may take up to 45 minutes, patience is required!
  - ✔ It is important to make sure the bat flies up and away on release and has not fallen to the ground nearby.

- Post-release monitoring
  - ✔ Where possible, monitoring should occur following release. This can be extremely important as the roost site is not always known and bat colonies frequently re-locate.
  - ✔ This is also an opportunity to involve the original finder of the bat, where interested.

Flight cages

General

- Flight cages are required for exercise and to test a bat's ability to fly and feed prior to release.
- The risk of transmissible diseases should be considered when potentially flying more than one individual after another in the same flight cage. The risks of flying both captive and releasable bats after one another should also be considered (refer to Health & safety).
- Care should be taken that the flight cage is secure to avoid escapes before the bat is ready for release.

Indoor flight areas

- Indoor flight areas are usually cages made of washable netting or secure indoor spaces.
- Adult bats that already hunt and know how to protect themselves from weather and predators can be flown in an indoor, secure, clutter free space but need enough flight time to recondition flight muscles.

Outdoor flight areas

- Outdoor flight areas are usually specifically designed enclosures.
- The flight cage should be a minimum of 8m x 4m x 2m.
  - This size cage will accommodate all species learning to fly (although a bigger sized cage would be preferable for noctules).
  - This size cage will also accommodate small species learning to hunt.
- Outdoor flight areas are essential for hand-reared bats (refer to Baby bats):
  - A hand-reared bat needs to be able to fly at will in an outdoor space,
  - They must have the opportunity to catch flying insects,
  - Three weeks of flight practice is required to develop flight muscles and echolocation skills before they are able to become independent.
- A flight cage needs to provide sufficient space for flight:
  - What species will be accommodated?
  - Is the site to be permanent?
  - Will there be a balance between flight space and furnishings/enhancement material?
- The cage should offer a choice of suitable shelters:
  - Wild bats choose different roosts on different occasions.
  - Different species and individuals will have different needs.
- Suitable food should be provided:
  - Consider how much natural food will be in the cage,
  - Can you increase the supply of natural food? E.g. moth traps, shallow or covered water traps (ensure bats cannot fall in) or stagnant water buckets (outside of the cage).
  - Has the bat got the skills to feed itself?
  - Does the bat need experience of catching its own food?
  - Does the bat know how to find supplementary food in a dish?
  - Will available food provide for increased calorie use in flight?
- Suitable water should be provided:
  - Is clean water available?
  - Is there scope to take water on the wing?
  - How will stagnation be avoided?
  - If the bat falls into the water can it get out again?
  - Is water available from dishes for bats that spend more time on the floor?
- The location of the flight cage should be considered in terms of:
  - Providing suitable conditions for bat rehabilitation,
  - Security,
  - Accessibility for local carers.

© Hazel Ryan

Bat flight cage

Baby bats

Short-term care and release

Baby bats often wander when left unattended, sometimes falling through small gaps in buildings and ending up away from the roosting site where they are found by people. In these situations a mother bat may respond to the calls of a baby bat as she emerges at dusk on the same day and it may therefore be possible to reunite the pup with its mother.

Upon collection or arrival into care, a baby bat should be checked for injuries or deformities. This is important to understand why the bat has been found away from the roost and whether a return to the roost will be possible.

Remember that juvenile bats (see diagram on page 10) which are just starting to fly and are still un-weaned will not be ready for independence and should be treated as babies.

Every attempt should be made to reunite a baby with its mother. Taking a baby bat into care should *always* be a last resort.

- ✔ The first action should always be to locate the roost site and ascertain whether bats are still present within the roost so that an attempt to reunite the bat with its mother can be made.
- ✔ A baby bat needs to be found by its mother to stand the best chance of surviving in the wild.
- ✔ If the roost site is not known and cannot be found, a release can be attempted from the place of finding.
- ✔ The bat may need to be taken into care temporarily if it is discovered during the daytime; the bat will need to be kept warm, rehydrated and possibly fed, depending on its condition.
- ✔ At dusk time the baby should be placed near to the roost site, to increase the chances of its mother being able to find it. This should be carried out by experienced individuals.
- ✔ Care should be taken not to disturb the roost whilst attempting to reunite the baby with its mother. Where there is a risk of disturbance to the roost a licensed bat worker may be required.
- ✔ It is important that the baby is kept warm throughout and is in an open container such as a cat litter tray into which the adult can fly, but which is too deep for the baby to escape from.
- ✔ Ensure the container is placed in a position that is retrievable if the exercise to reunite is unsuccessful.
- ✔ As the adult females emerge from the roost they will hear the baby bat calling and hopefully fly near enough to investigate. If successful the mother will pick up the bat and take it back into the roost. A bat detector is helpful for checking that the baby bat is still calling for its mother.
- ✔ A baby bat should never be left out overnight. If it isn't collected during the emergence period and there is bat activity a second attempt can be made just before dawn or (more practically) just before emergence the next evening with the baby taken back into care and fed between attempts.
- ✔ Where possible very cold, windy or rainy evenings should be avoided as these conditions are less favourable to bats generally and a successful release is less likely in these conditions.
- ✔ Alternative methods to return the baby bat directly to the roost can be considered but require involvement of a licensed bat worker and additional knowledge of the roost.
- ✔ Where multiple babies are discovered from a roost this could suggest an underlying issue with the roost and advice from an experienced bat worker should be sought.

© Bryan Brown

Reuniting a baby bat with the roost

Ethics

If reuniting the baby with its mother is not possible, next steps should be considered with reference to the following:

- ✔ The options that can be considered are hand-rear for eventual release or euthanasia.
- ✔ Hand-rearing is labour and resource intensive.
- ✔ Hand-reared bats need sufficient time in a flight tent and an outdoor flight cage if they are to gain the skills necessary for release.
- ✔ Limited information is available on the long-term success of releasing hand-reared bats into the wild.
- ✔ Experience has shown that successful rehabilitation and release is more likely with older babies. Those still at stages A, and B and starved babies at stage C may be very difficult to rear to release (see diagram page 10). These individuals can have problems in developing good bone structure and immune systems – euthanasia should be considered for baby bats at these stages.
- ✔ Successful rearing of a baby bat (for release) is acquired through experience and should only be considered by, or in consultation with, an experienced bat rehabilitator.
- ✔ Permanent captivity (for education) should never be the intended outcome when deciding to hand-rear a baby bat.
- ✔ Those considering hand-rearing must have access to the necessary equipment (including flight cages) and be informed of and committed to the requirements of each stage of a baby bat's rehabilitation as set out below.
- ✔ Euthanasia should be considered in cases where the baby bat has an injury, fails to thrive or where there is no-one suitable to hand-rear (see Euthanasia – how to).

Advice should be sought from experienced rehabilitators in any situation where an individual is unsure of the most suitable outcome.

© Kay Bott

Baby bat

Housing

- ✔ Very young bats tend not to move very far and can be kept in a faunarium (small plastic animal container) with a heat source (see below).
- ✔ A container that is 18 x 11 x 12.5cm and lined with soft cloth or fleece is adequate for a single baby (that is not very mobile).
- ✔ The bat should have sufficient space to stretch its wings.
- ✔ As the bat becomes more active it will need a bigger space in which to exercise. A net/textile mesh cage, for example a medium reptarium, with a heat mat attached is appropriate.
- ✔ After a period of isolation and observation, housing of the bat with others may be considered:
  - This will depend on the plans for release such as if babies are to be released together (but not at the original roost site) - see Ancillotto *et al* 2012 (see Further information, support and references),
  - Baby bats kept in groups tend to progress more quickly as they watch and learn from each other,
  - The potential disease related consequences of keeping bats together needs to be carefully considered (See Health and safety>Isolation).

Temperature

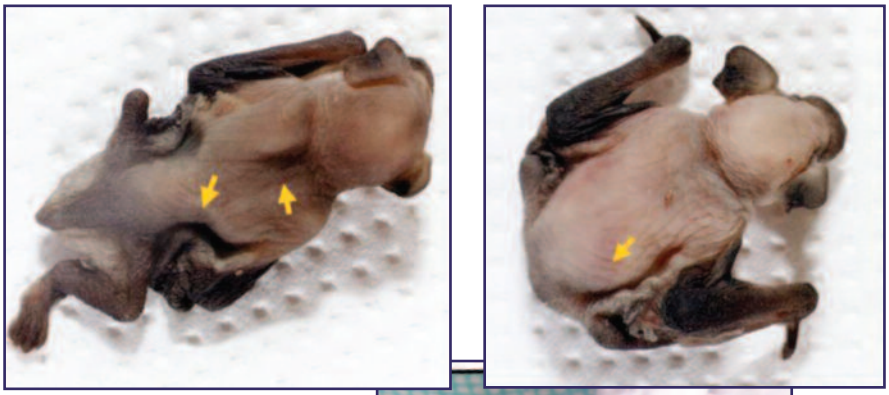
- A baby bat must be kept warm at all times to digest food and aid growth. A minimum of 25°C and a maximum of 35°C are suggested in the Bat Rescue Manual.
- A thermometer in or attached to the cage will help to maintain an appropriate temperature whatever heat source is used.
- Heat can be provided by a heat mat attached to the outside of the cage. Alternative options include a hot water bottle (regularly refilled) that is placed underneath one end of the cage.
- Baby bats need to be able to move away from excess heat but should not be allowed to become cold or torpid.

© Maggie Brown

Heat mat attached to the back of baby bat housing

Feeding

- In the wild a baby bat would feed on its mother's milk. In care, a substitute for the mother's milk is required.
- Milk substitutes should be low in carbohydrates and high in protein and fat. The decision as to which milk substitute product to use should be based on experience, success and with discussion from other more experienced carers.
  - New carers should contact BCT or more experienced carers to discuss options for milk substitutes.
  - All milk substitutes should be offered warm to the bat.
- Once the bat is rehydrated milk can be administered with a fine paintbrush, a small plastic syringe or a pastette. This is a learning experience for both bat and carer. This method should be tried with water in the first instance.
- Feeding should be little and often to begin with; a small, very shallow, clean container with a few drops of water left in the cage with the baby will allow the baby to drink in between these times. This should be replenished on a regular basis.
- Bigger babies approaching weaning can be fed less often as they will take more at each feed.
- Most babies will back away when they have satisfied their appetite.
- Frequency and quantity will vary with different milk substitutes so advice should be sought.
- Milk should be provided fresh for every feed.
- It is important to avoid food or water entering the bat's nostrils and causing breathing difficulties, or spilling food or water down the bat's chin and chest as this can cause irritation and fur loss. Avoid 'mopping' spills as this damages fur, instead these spills should be lifted off gently with a tissue or similar absorbent material.



Photos © Bryan Brown

Left: Baby bat starved.
Right: Baby bat well fed

- Any water container left in the cage should be very shallow so that the bat doesn't drown or sit in the water and lose heat from evaporation.
- Consider dehydration - a thirsty pup might overfeed, or may dribble deliberately. Extra water can be given from a clean paintbrush, syringe or pastette.
- When the time is right a baby bat can be slowly weaned onto mini mealworms.

Feeding a baby bat

Growth and development

- ✔ The bat should be regularly monitored to assess its progress and care adjusted accordingly. Progress should be measured against the different stages of development (see diagram page 10).

Weaning

- ✔ It is important not to rush this stage. Bats in the wild are not weaned until after they have acquired sufficient flying skills to hunt their own insect prey. Weaning should therefore begin once bats have developed some real flight.
- ✔ A baby bat that is ready to be weaned will start to show signs of this – such as biting at feeding tools.
- ✔ Mealworms should start to be introduced gradually to the bat's diet. To begin with a decapitated mini mealworm can be offered.
- ✔ Gradually milk feeds can be replaced one at a time with mini mealworms offered from tweezers.
- ✔ Mealworms contain insufficient nutrition for a developing bat. Consideration should be given to gut loading the mealworms to provide extra nutrition. Decisions on which nutrition substitutes and supplements to use should be based on veterinary advice, experience, success and with discussion from other more experienced carers.
- ✔ Each bat will be different and some individuals will take longer to feed than others.
- ✔ A bat that stretches it's wings and shows signs of muscle development by doing "push ups" is ready for flight practice. At this stage young bats making attempts to fly, will require extra calories to compensate for the extra energy used in flight.
- ✔ Weaning can continue whether young bats are in a flexible practice cage or an outdoor flight cage.

Rehabilitation

- ✔ A bat which was brought into care as a baby and has developed to an appropriate stage to consider release will still need to satisfy the criteria set out in the Rehab and release section on:
  - Flight,
  - Echolocation,
  - Feeding,
  - Grooming.
- ✔ Special attention should be given to the bat's ability to navigate and feed – although navigating and feeding behaviour appears to be instinctive baby bats need time and opportunities to learn and refine their skills.
- ✔ Having access to a range of indoor flight areas before going into an outdoor flight cage gives young bats chance to develop their flight muscles and stamina so that they spend less time on the floor in the outdoor cage.
- ✔ Options for (internal) flight areas include reptariums, tents, pet playpens, mesh or screen tents and homemade nets.
- ✔ Indoor flight areas should offer soft landings, be hazard free and predator proof.
- ✔ When satisfied with the bat's abilities in an indoor flight area, the bat should progress to an outdoor flight cage.

© Gail Armstrong

Indoor flight area

- ✔ Outdoor flight cages should provide opportunities for roosting and catching live insects (see Flight cages section for more information).
- ✔ Where flying un-weaned bats in a flight cage, ensure they are fed on milk during the day and offered heat before being placed in the flight cage at night.
- ✔ It is important to consider the warmth that an un-weaned bat requires. Bats should not be flown in unseasonable conditions and opportunities provided for bats to cluster together as they would do in the wild.
- ✔ When bats are first in the flight cage they may not have the skills to echolocate and fly back to bat boxes to roost. If so they should have concealed themselves at dawn (i.e. under tea towels pinned up in strategic places) and can be retrieved and placed in the bat box after feeding. Eventually their skills will enable them to pursue and take insects, or if necessary (if insects are temporarily in short supply) take insects in flight from strategic dishes of mini mealworms (large species will manage regular mealworms) and later return to the bat box without difficulty. A choice of bat boxes will allow for the nomadic behaviour of pipistrelle juveniles.
- ✔ It is important that bats have a minimum of 3 weeks of experience in the outdoor flight cage before considering release.
- ✔ Additional information on flight cages is provided in the Flight cages section.

Release

- ✔ Release depends upon the bat's ability to fly, take food and water on the wing and find cover in daylight.
- ✔ The bat should be in good body condition before release.
- ✔ Several days of good weather are preferred ahead of the release date to ensure that the bat is being released in optimal conditions.
- ✔ Individual bats from known roosts (that are ready for release) can be released from a gloved hand as the colony emerges, if the roost can still be located. Currently there is no research to indicate how reliable this method is and it is important that bats released like this have developed the necessary skills to survive.
- ✔ Young bats of larger species will learn to fly in a large flight cage, but will not have the space to hunt on the wing. They can be soft released from a suitable familiar bat box with support feeding. Advice should be sought from experienced carers.
- ✔ Research by Ancilotti *et al* 2012 (see Further information, support and references) on juvenile bats indicates that social links are established during the nursery stages.
  - Rearing young bats from the same colony together or putting together groups of juveniles where their original roosts are not known may have a beneficial effect (but consider health and safety, see Health and safety>Isolation).
  - Such groups can be released from a familiar bat box (one they can easily fly back into) either close to the original roost (where known), or in an area of suitable habitat, in the general area of finding (also see Kelly *et al* 2008, 2012).
  - Soft release with supported feeding may be possible depending on circumstances, and advice should be sought.
- ✔ In situations where an individual is deemed unsuitable for release a decision should be made on whether to euthanise the individual or keep in permanent captivity (and use for educational purposes). See Ethics. Euthanasia should be considered at every stage in the decision making process.

Post-release monitoring

- ✔ Monitoring hand-reared bats post-release takes organisation and knowledge of appropriate methods and often is beyond the skills and capacity of individual bat carers.
- ✔ However further advice and support may be found if a suitable opportunity (for example a large number of babies from a known roost) occurs.
- ✔ If this is likely, organisation must start as soon as the bats come into care.
- ✔ The limited knowledge we have of survival after release has come from initiatives taken by bat carers.
- ✔ Further information is available in:
  - Kelly *et al* 2008. Post-release survival of hand-reared pipistrelle bats
  - Kelly *et al* 2012. Further evidence for the post-release survival of hand-reared, orphaned bats based on radio-tracking and ring-return data.
  - Serangeli *et al* 2012. The post-release fate of hand-reared orphaned bats: survival and habitat selection.
  - See Further information, support and references.

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Ringing an adult bat in preparation for release when the wing is completely healed

Horseshoe bats

General

- ✔ Horseshoe bats have a pelvis that is shaped differently to other UK bats. This means that they cannot crawl around as vesper bats do.
- ✔ Horseshoe bats use their wings as protection from the elements – this makes them very vulnerable when handled.
- ✔ Horseshoes have backwards facing knees - a stressed horseshoe will bend its knees.
- ✔ Horseshoe bats are extra sensitive to noise and environmental change.

Handling

- ✔ Handling can cause severe discomfort or even break the bat's fingers if it is done incorrectly.
- ✔ Handling should be kept to a minimum and be gentle at all times.
- ✔ The wings should not be touched.
- ✔ Support should be offered by giving the bat a pencil or skewer to grip between its toes.

Transporting

- ✔ Transport mesh pens need to be covered.
- ✔ The bat must be able to hang up and off the ground.

Housing

- ✔ The bat must be able to hang free, without anything touching its wings.
- ✔ Food and water must be offered at a raised level so the bat can reach it without having to come down to the ground.
- ✔ The bat needs space to open its wings, side step across the entire ceiling of the pen, and ideally fly.
- ✔ Part of the pen should be in complete darkness and ideally the bat should never be disturbed in this "safe" area.
- ✔ Care for this species should only be done in the evening once it is dark as this is the natural time for it to be awake.
- ✔ Heat mats can either be situated on the base of the pen or hanging from one side. Never heat the entire pen or use an overhead heat light.
- ✔ Horseshoe bats have a large wing surface and can dry out easily – consider a humidity chamber.

Exercise

- ✔ Horseshoe bats need to be exercised during the evening/night.
- ✔ Suitable roosting spots should be provided on the ceiling of the flight pen.
- ✔ Water and food should be provided at height.

© Samantha Pickering

Food and water bowls at height

© Gareth Jones

Lesser horseshoe bat

Legislation, licensing, equipment and expertise

Legislation

- ✔ All bats and their roosts in the UK are protected – it is an offence to injure a bat or obstruct/destroy a roosting site.
- ✔ UK bats are protected under:
  - Wildlife and Countryside Act 1981,
  - Conservation of Habitats and Species Regulations 2010 (as amended) (England and Wales),
  - Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (Scotland),
  - Conservation (Natural Habitats etc) Regulations 1995 (Northern Ireland).
- ✔ A bat can be taken into care for the purpose of release back into the wild, providing there is no satisfactory alternative.
- ✔ Euthanasia can be carried out if it is in the welfare interest of the bat. This does not necessarily need to be delivered by a veterinary professional but the rehabilitator must be competent and able to carry out the procedure humanely.
- ✔ The keeping of bats in permanent captivity is now licensable.
- ✔ Animal welfare legislation
  - Animal Welfare Act 2006 (England and Wales), Animal Health and Welfare Act 2006 (Scotland), Welfare of Animals Act 2011 (Northern Ireland).
  - Introduce legal requirements on people who are responsible for animals that are in captivity, even temporarily, effectively setting a requirement for keepers to meet the needs of those animals.
  - An animal's needs include:
    - Its need for a suitable environment,
    - Its need for a suitable diet,
    - Its need to be able to exhibit normal behaviour patterns,
    - Any need it has to be housed with, or apart from, other animals,
    - Its need to be protected from suffering, injury and disease.
  - For more detailed information about the Animal Welfare Act please refer to the "Animal Welfare Act 2006 – guidance for wildlife rehabilitators, RSPCA 2007".

Licensing

- ✔ A possession licence is required for the possession of wild bats, in England, Wales and Scotland via the relevant Statutory Nature Conservation Organisation (SNCO) (please refer to the Further information, support and references section for more information). These licences cover:
  - Captive bats, kept for education purposes only. An individual will need to justify the keeping of bats in captivity on the licence application,
  - Keeping of dead bats (obtained after 1994).
- ✔ It is recommended that a licence be obtained for any bat that has been in care for longer than 6 months, even if the intention is to release the bat once recovered.
- ✔ In Northern Ireland possession licences can be issued for education purposes where required – this should be discussed with the SNCO.
- ✔ It is important to keep a record of each bat as this may be needed for reporting purposes – this will include where the bat came from, injuries, treatment, when released, any individuals that died, as well as those to be kept for education, etc.
- ✔ Support and further information is available from BCT and the SNCOs (see Further information, support and references).

Equipment needed

- ✔ Cages and cloth for lining.
- ✔ Food source – e.g. mealworms.
- ✔ Gloves – this should be a pair for each bat cage. Vinyl or latex gloves can be worn over protective gloves so that infections are not transferred from bat to bat.
- ✔ Appropriate heating.
- ✔ Tools for administering water, etc e.g. fine paintbrush, plastic syringe.
- ✔ Tweezers – for feeding mealworms.
- ✔ Weighing equipment.
- ✔ Measuring equipment e.g. a six inch ruler for forearm measuring.

A rehabilitator should be able to:

- ✔ Make an evaluation of a grounded/injured bat.
- ✔ Safely collect and transport a bat to a more experienced bat rehabilitator where necessary.
- ✔ Demonstrate safe working procedures.
- ✔ Provide a suitable environment and care for bats in captivity.
- ✔ Age, sex and identify bats to species.
- ✔ Examine a bat and assess its condition and health.
- ✔ Know when to request help from a vet or more experienced bat carer.
- ✔ Safely release a captive bat.
- ✔ Assess when a bat requires euthanasia.
- ✔ Set up and maintain a recording system.

Further information, support and references

Contacts

- Bat Conservation Trust
  Quadrant House
  250 Kennington Lane, London SE11 5RD
  Helpline 0345 1300 228
  www.bats.org.uk
  www.bats.org.uk/help (for information about how to contain a grounded bat)

SNCOs

- Natural Resources Wales
  (formerly Countryside Council for Wales)
  Tŷ Cambria,
  29 Newport Road, Cardiff CF24 0TP
  0300 065 3000
  www.naturalresources.wales

- Northern Ireland Environment Agency
  (formerly Environment and Heritage Service)
  Biodiversity Unit
  Klondyke Building
  Cromac Avenue
  Gasworks Business Park
  Lower Ormeau Road, Belfast BT7 2JA
  028 90395264
  www.doeni.gov.uk

- Scottish Natural Heritage
  Great Glen House
  Leachkin Road, Inverness IV3 8NW
  01463 725364 (legislation/licensing questions)
  01463 725165 (bats in houses helpline - not for grounded bat calls)
  www.snh.gov.uk

- Natural England
  4th Floor, Foss House
  Kings Pool
  1-2 Peasholme Green
  York YO1 7PX
  0300 060 3900
  www.gov.uk/government/organisations/natural-england

- RSPCA
  Wilberforce Way
  Southwater
  Horsham
  West Sussex RH13 9RS
  Advice line 0300 1234 999
  www.rspca.org.uk

- Animal and Plant Health Agency
  Rabies Diagnostic Unit
  Woodham Lane
  Addelstone
  Surrey KT15 3NB
  03000 200301

- West Yorkshire Bat Hospital
  10 North Avenue
  Otley
  West Yorkshire LS21 1AJ

Support

- BCT Bat Care Network
  - ✔ BCT has a list of bat carers/ambulance drivers, regional helplines and wildlife hospitals throughout the UK known as the UK Bat Care Network. This is a network of volunteers that may be able to provide guidance and assistance to those who have found an injured or grounded bat in order to give the bat in question the best chance to be rehabilitated and released back into the wild.
  - ✔ In 2015 BCT responded to over 15,400 enquiries, and 54% of that total figure related to bats in distress and in need of assistance. The number of bat care enquiries continues to increase annually. During peak times in the summer, the helpline can take over 300 calls about injured or grounded bats per week. As of August 2016, the Network had over 400 bat care contacts.
  - ✔ In areas where there are no bat carers available BCT advises callers to take any bats found directly to a local vet and suggest that the vet call the Helpline (0345 1300 228) for information if they are not familiar with bats.
  - ✔ More information is available on 0345 1300 228 or enquiries@bats.org.uk.

- Bat care fundraising
  - ✔ For those involved with bat care, generating the funds to acquire equipment can be difficult. Local bat groups and networks are hugely beneficial in providing support and advice but there are also additional options to consider for fundraising of required resources.

- ✔ Members of the public may be interested in donating to bat care following help with a bat or after contact with a local carer. The list below presents several ideas that build on this interest from the public. These options assume that no contact/group is a registered charity:
  - **Dedicated care pages** on social media can be excellent for generating awareness around the local community and offer an easy way for updates to be conveyed to a large audience i.e. a successful release of a bat in care.
  - **Online wishlists** such as Amazon can be utilised and allow contributions in the form of equipment to be provided directly. They also allow the donator to choose how they help i.e. a tub of mealworms or a small flexarium cage.
  - **Public events/bat walks** can offer an opportunity for face to face awareness raising and discussion about donations and how they are used.
  - **Merchandising**, if affordable to invest in, can be a great way to spread awareness and raise funds, for example t-shirts, mugs and silicone bands.
  - **Stamp recycling** is a small funder as the stamps are sold per kilo, but can be an easy way to get people involved and does not require huge amounts of effort to obtain.
  - **Easy fundraising** is an online resource where donations go towards a good cause and the applier does not need to be a registered charity. http://www.easyfundraising.org.uk/
  - **Sponsoring a bat** provides an opportunity for the public to feel more directly involved. It may involve donating a small amount to help in the care of a rescued bat, and in return the member of the public chooses a name for the bat.
  - **Supermarket schemes** are often run after store openings or during certain months to promote local causes for the community and may consider promoting bat care.

This is not an exhaustive list, rather it is designed to provide some suggestions of ways in which fundraising can be achieved if required. It is possible that several approaches may work together. Ethics and Health & safety should always be considered when using photographs/resources that will be seen by the general public.

References and further reading

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* Please note that the findings of this paper in relation to wing tears have been partly replaced by later work.

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