

Bat Conservation Trust

Bat Care Guidelines

A guide to bat care for rehabilitators



Bat Care Guidelines

A guide to bat care for rehabilitators

Contents

Summary and First Points	3
Health and safety	4
Ethics (captivity and when to euthanise)	6
Rescue and collection (first aid)	8
Ailments and treatment	10
Medicines (to be used in conjunction with a vet)	13
Euthanasia (how to)	14
Care and conditions	15
Rehab and release	18
Legislation, licencing, equipment, expertise	20
Further information, support and references	21
Acknowledgements	23

Summary and first points

These guidelines were produced as a result of a Bat Care and Rehabilitation Best Practice Workshop that the Bat Conservation Trust held in early 2007. The aim of this workshop was to invite experienced individuals in the field of bat care to discuss current knowledge and information available about bat care. Where possible the workshop aimed to gain consensus and agree minimum standards.

These guidelines are aimed at veterinary professionals, wildlife hospitals and new 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.

The running of the workshop and the production of these guidelines was made possible by generous funding from:

- British Veterinary Association Animal Welfare Foundation (BVA-AWF)
- Royal College of Veterinary Surgeons Trust (RCVS)
- Royal Society for the Prevention of Cruelty to Animals (RSPCA)

Things you must have/do

You must obtain contact details of where the bat was found

- 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.
- Handling
 - ✓ Should be kept to a minimum.
 - ✓ Avoid stressing the bat out any more than necessary.
- 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 the experience and ability of the rehabilitator.
- Resources and time
 - ✓ Consider the resources required for both short and long-term care e.g. housing, food, flight cages.
 - ✓ Consider the time that a rehabilitator 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.



Bat care and rehabilitation best practice workshop

©BCT



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 glove details is available from the Bat Conservation Trust.](#)
- ✓ Separate gloves, to prevent disease transmission, should be used when handling different bats.
- ✓ 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.
- ✓ 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 species 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 have been affected by European Bat Lyssavirus (a rabies-related virus) – 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 [Bat Conservation Trust](#) helpline in this situation for further advice.
- ✓ For more information and help to identify the species in your care (see [References section for further details](#)):
 - ◆ Field Studies Council – A Guide to British Bats,
 - ◆ Greenaway & Hutson – A Field Guide to British Bats,
 - ◆ Stebbings, Yalden & Herman – Which Bat is That?

○ European Bat Lyssavirus (EBLV)

- ✓ In the UK a small number of bats are known to have been affected by a virus related to rabies called European Bat Lyssavirus (EBLV1&2).
- ✓ To date in the UK, no individuals have been found with the live EBLV1 virus – although a single serotine bat did test 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 seven individuals testing positive for the live virus in the UK (number correct as of May 2008).

- ✓ EBLV is usually transferred via a bite or a scratch.
- ✓ 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 [VLA](#) for testing. For further information please contact [BCT](#).

○ 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).
- ✓ At the time of print we recommend that Daubenton's bats are not used for public events. This will be reviewed regularly, please check with [BCT](#) for the most current advice.
- ✓ 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).
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,
 - ◆ 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.



A captive bat being used for education

© BCT

Ethics (captivity and when to euthanise)

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?

- 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,
- ✓ Welfare of the bat species,
- ✓ Impact on the wider environment,
- ✓ 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 be using 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 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,
- ✓ The bat's chance of survival in the wild following rehabilitation ([see Rehab and release section](#)),
- ✓ 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.

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 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, including the brain,
- ✓ If the bat has brittle bones (ongoing possibility of hurting itself),
- ✓ If the bat has only one fully functioning wing (not able to eat, groom, etc).

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.

○ Babies

Every attempt should be made to reunite a baby with its mother (see [Rehab and release section](#)). If this is not possible the options available (rehab and release, permanent captivity, euthanasia) should be considered with reference to the following:

- ✓ Hand-rearing is labour and resource intensive,
- ✓ Limited information is available on the success of releasing baby bats,
- ✓ Ethical consideration should be given to the rearing of a bat to use for education,
- ✓ Experienced rehabilitators have noted that a baby bat older than seven days when brought into care has a higher chance of survival than baby bats less than a week old,
- ✓ Successful rearing of a baby bat (for education or release) is acquired through experience and should only be considered by, or in consultation with, an experienced bat rehabilitator.

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



Successful rearing of a baby bat is acquired through experience

Rescue and collection (first aid)

Check list	
First aid	
Contain the bat	✓
Diagnosis	✓
Keep a record	✓
Rehydration	✓
Feeding	✓

First aid – the aim is to cause no harm

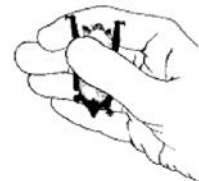
○ Containing the bat

- ✓ 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.
- ✓ Using a clean cloth or tea-towel, cover the bat and gently transfer the whole thing into a secure box.
- ✓ This 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, shallow container 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 a tissue placed in the shallow container will avoid spillage or drowning.

○ Handling and examination of bat

- ✓ How to hold – a bat should NEVER be handled by its wings during the course of examination.

Correct way to handle a bat



✓ How to examine:

- ◆ Observe the bat in its container before picking it up – how it moves, 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, and gently extending the wings (as shown in the photo opposite). Information on examining bats is given in Chapter 8, p98 [BSAVA Manual of Wildlife Casualties](#) and in Section A Rescue, pages A8 and A9 of the [Bat Rescue Manual](#).



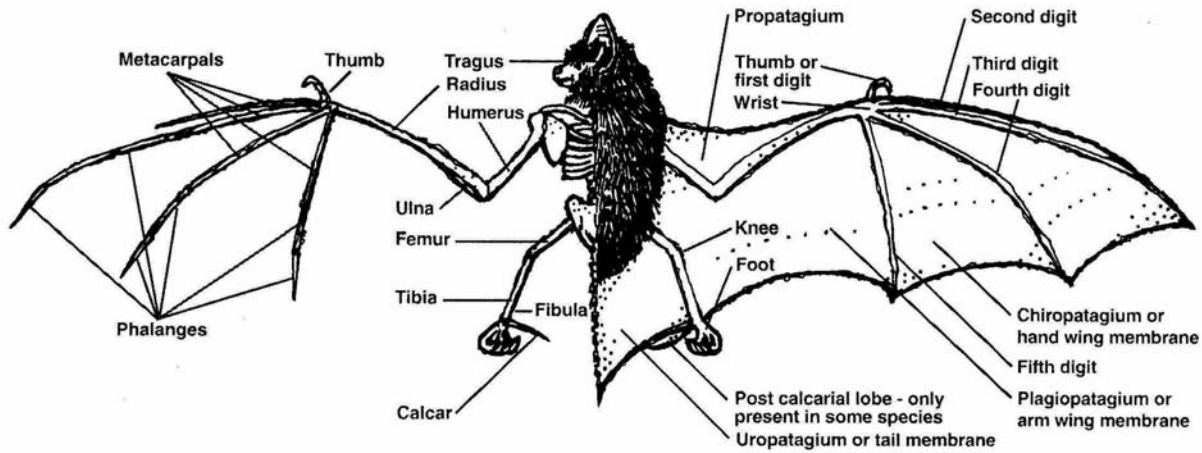
© BCT

Extending a bat wing for examination

✓ Look for:

- ◆ Fractures, holes, tears or bleeds in the membrane,
- ◆ Foreign bodies,
- ◆ Dullness of the membrane caused by dehydration or dust,
- ◆ Ectoparasites/ticks,
- ◆ 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,
- ◆ Entanglement,
- ◆ Condition of bat – e.g. pregnant, undernourished, etc.

- ✓ 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.



© Maggie Brown

○ Rehydration

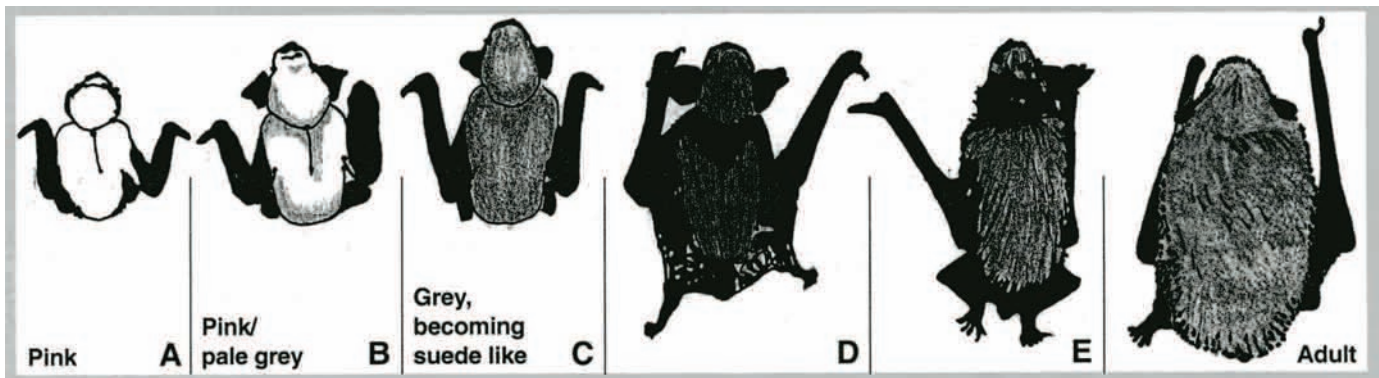
Almost every bat that comes into care will need rehydration, food and rest before being released back into the wild.

Dehydration should be a primary concern; very often a bat will not want, or be able, to eat until it is rehydrated.

- ✓ Oral rehydration is preferable – water should be used primarily to rehydrate a bat.
- ✓ Electrolytes in the form of oral rehydration fluids can be used, e.g. Lectade® – using a pipette or small paintbrush.
- ✓ Subcutaneous fluid – please note that this should only be administered under veterinary guidance.

○ 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. For further information on baby bats please refer to the [Bat Rescue Manual](#).
- ✓ If the bones are not yet ossified, please refer to the [BSAVA Guidelines](#) for further information.



© Maggie Brown

○ Check list

It is essential to record as much information as possible about each bat; this is necessary for new licensing regulations ([see Licensing section](#)) but is also important for the continued treatment and care of the bat as well as the eventual release.

- ✓ 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.
- ✓ 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.
- ✓ Age of individual – the care and treatment will depend on the age of the individuals being dealt with – it is particularly important to identify as soon as possible if the individual is a [baby](#) ([See Care and conditions section](#)).
- ✓ Initial assessment – is there any obvious damage, bleeding, etc.

Ailments and treatment

This page 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. 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	<ul style="list-style-type: none"> • 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. 	<ul style="list-style-type: none"> • Immobilise (smaller species) • Intramedullary pins or internal fixators (with antibiotic cover) for larger species. • For minor wing-tip and distal phalange injuries – tidy up with removal of non-viable tissue – through careful dissection under general anaesthesia. • Amputation (generally precludes release of bat to wild). 	<ul style="list-style-type: none"> • Is it a simple or compound fracture? • Will it regain full mobility? • Substantial fractures repaired carry poor prognosis for release. • Surgical procedures (pinning and amputation) require a certain amount of veterinary experience and skill to be successful. • 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, roosting and may cause stress through phantom appendages. • Simple fractures may heal if restricted but care is needed because of the delicate wing membrane.
Holes and tears	<ul style="list-style-type: none"> • With a hole injury the wing margin remains intact – this type of injury has a better prognosis than an injury involving a tear. • A tear is defined as a hole that includes the wing margin. • Mostly caused by cat attacks. • Bats may also have old holes that do not inhibit flight. 	<ul style="list-style-type: none"> • Antibiotics may be necessary if damage is cat-related. • Small holes and rips in the membranes can be left to heal naturally. 	<ul style="list-style-type: none"> • Will the bat be able to fly following rehab? • Are the holes small enough to heal? • How close to the wing margins are the holes located? • Will resultant scar tissue reduce mobility?
Puncture wounds <ul style="list-style-type: none"> ◆ Skin punctures ◆ Subcutaneous emphysema 		<ul style="list-style-type: none"> • Prophylactic antibiotics for cat damage. • Deflation of subcutaneous emphysema with a small sterile hypodermic needle and provision of antibiotic cover. 	<ul style="list-style-type: none"> • Depth and site of puncture. • Possibility of internal injuries.

Ailment	Cause/info	Treatment options	Considerations
Foreign bodies <ul style="list-style-type: none"> ◆ Fish hooks ◆ Bee stings 	<ul style="list-style-type: none"> • 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. • Bee stings often occur as small white lumps in the membrane. 	<ul style="list-style-type: none"> • Disentanglement may require general anaesthetic. • Cleaning with antiseptic. • Antibiotic cover. 	<ul style="list-style-type: none"> • Depth of injury. • Circulatory impairment.
Sticky bats <ul style="list-style-type: none"> ◆ Dust/powder ◆ Goopy stuff ◆ Oil ◆ Fly paper 	<ul style="list-style-type: none"> • Consider contacting the manufacturer's helpline to discover what is in the product and the best way to remove it. • Beware of the potential toxicity of some recommended solvents. 	<ul style="list-style-type: none"> • Dust or powder can be removed using a fine paintbrush. • Water-soluble contaminants 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. • Oil-based contaminants can be removed with butter, vegetable oil or margarine, then mild soap or detergent to remove oil, and clean water to remove the detergent/soap. • Fly paper – cut away as much of the paper as possible to avoid further sticking and stress. Margarine, butter or milk can then be used to remove the stickiness – washed off with household detergent. Use clean water to remove the detergent. 	<ul style="list-style-type: none"> • Length of time affected. • Proportion of body covered. • Parts of body covered - time taken for hair to re-grow depends on the state of moult. It may not re-grow for several months. • Material ingested by grooming may have effects.
Ectoparasites <ul style="list-style-type: none"> ◆ Ticks ◆ Maggots ◆ Fleas ◆ Mites ◆ Ringworm 		<ul style="list-style-type: none"> • Physically remove fleas and mites, but not ticks, with a fine paintbrush or tweezers. • Permethrin or pyrethrin-based flea powder applied sparingly to parasite. 	<ul style="list-style-type: none"> • Age of bat. • Load level.
Other skin/membrane problems <ul style="list-style-type: none"> ◆ Infection ◆ Minor wounds ◆ Sticky wing/dry membranes ◆ Fur loss 	<ul style="list-style-type: none"> • Sticky wing - this has a very broad interpretation and can include; <ol style="list-style-type: none"> 1. A genuine stickiness to the wing membranes that causes adherence when the wings are folded. 2. An apparently sticky wing due to dehydration, as this causes the wing membranes to lose their resilience and elasticity. 	<ul style="list-style-type: none"> • Antibiotics (minor wounds and infection). • Sticky wing <ol style="list-style-type: none"> 1. Bathing in tepid water can be beneficial. Remove parasites. Keeping the cage very clean improves the situation. 2. If the apparently sticky wings are as a result of dehydration, rehydrating the bat can be successful (in the early stages of the condition). Euthanasia should be considered if the condition is too advanced. <ul style="list-style-type: none"> - A vet may need to be consulted if sticky wing conditions persist. • Fur loss <ul style="list-style-type: none"> - Localised fur loss – look for ticks. - Fur loss under the chin and down the belly – take care with mealworm insides as these are an irritant; give smaller mealworms. - Fur loss on lower belly – may be incontinence. Avoid cage getting damp. 	

Ailment	Cause/info	Treatment options	Considerations
Diarrhoea	<ul style="list-style-type: none"> Dehydration can be a symptom of diarrhoea. 	<ul style="list-style-type: none"> To treat diarrhoea – oral fluids should be used primarily. Subcutaneous fluids can be considered as a second option if performed by a vet or trained person. Rehydration with proprietary electrolyte solution. 	<ul style="list-style-type: none"> Could be manifestation of minimal gut contents following starvation.
Starvation		<ul style="list-style-type: none"> Rehydration should be initiated before trying to give the bat food. Then use liquid food or diluted mealworm insides, gradually increasing viscosity. 	<ul style="list-style-type: none"> The cause of the problem – are there underlying factors that have prevented the bat from feeding? How long has the bat been suffering for?
Poisoning	<ul style="list-style-type: none"> 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. 		<ul style="list-style-type: none"> 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.
Rabies	<ul style="list-style-type: none"> Rabies symptoms seem to 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. 	<ul style="list-style-type: none"> Any bat displaying rabies symptoms will need to be quarantined and euthanasia considered. Please contact BCT immediately if a bat in your care is displaying any abnormal symptoms. 	<ul style="list-style-type: none"> Species of bat. Other possible injuries that could cause similar symptoms.



Whiskered bat

© J J Kaczanow

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

Only a veterinary surgeon can diagnose and treat disease. Veterinary medicines can only be dispensed for animals in the vet's care.

○ Antibiotics

- ✓ The use of antibiotics should be very carefully considered.
- ✓ The size of the bat in care and the variable metabolism of bats must be taken into account.
- ✓ All antibiotics should be given orally.
- ✓ The information below is taken from the [Diagnostic & Treatment Update for the Rehabilitation of Insectivorous Bats](#). This document can be downloaded from:
http://www.batworld.org/worldbatline/pdf_files/Diagnostic&TreatmentUpdate.pdf
- ✓ This table should only be used as a guide and further information should be sought prior to any treatment.

Antibiotics	Dose/g bw	Dosage	Warning
AMOXICILLIN Rx (Oral Suspension, 50mg)	0.005ml/g	0.05ml BID	
BAYTRIL® Rx Injectable Solution (Enrofloxacin 2.27%)	0.0001ml/g	To administer orally, mix 0.25ml Baytril® with 1ml of fruit juice. Administer 0.05ml BID.	This should only be administered to pups, or pregnant or lactating females if the condition is life-threatening.
CLAVAMOX® Drops Rx (Amoxicillin trihydrate/ Clavulanate potassium).	0.005ml/g	Reconstitute with 14ml water. Administer 0.05ml BID.	Keep refrigerated. Discard after ten days. Do not use if mixture becomes discoloured.
KEFLEX® Rx Oral Suspension (Cephalexin 250mg/5ml)	0.005ml/g	To reconstitute, mix 5ml (one tsp) water with 8gm (one tsp) Keflex® and administer 0.05ml BID.	Keep refrigerated.

This data has been generated using drugs available in the USA. A veterinary or human medical equivalent is available in the UK and these pharmaceutical compounds have been used in the UK by veterinary surgeons working with UK native species.

○ 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

- ✓ Oral meloxicam can be titrated down in a mg/kg basis from the standard dog dose. Further information can be found in the [BSAVA Manual of Wildlife Casualties](#).

○ Needles

- ✓ A very fine needle that permits the more viscous drugs to pass through, should be used.
- ✓ One veterinary professional (who works with bats) uses a 0.5ml insulin syringe with a 29 gauge needle fixed to it.

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 and should only be used by a vet or trained lay person under veterinary guidance.
- Dead bats
 - ✓ All dead bats should be sent to the Veterinary Laboratories Agency (VLA) for inclusion in their passive surveillance programme for EBLV. See [Health and safety](#) for more information on the VLA and EBLV.
 - ✓ Tubes and address labels can be obtained from [BCT](#) or the [VLA](#).



Test tubes for the VLA passive surveillance programme

© BCT



Juvenile Leisler

©Hazel Ryan

Care and conditions

Check list	
Care and conditions	
Housing	✓
Temperature	✓
Feeding	✓
Exercise	✓
Continued assessment	✓
Hibernation	✓

○ Housing – general considerations

General considerations

- ✓ Must be possible to clean and sterilise the container.
- ✓ Possible housing to use includes plastic pet containers, reptariums and wooden boxes – although the latter are most difficult to clean.
- ✓ Needs to be escape proof.
- ✓ Choices for roosting/natural behaviour should be considered – especially for long-term and permanent captives.
- ✓ Smooth surfaces may need scoring or roughing up, especially wood; 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.
- ✓ When 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

- ✓ Recommended size of 40x25x25cm for a small bat species and 48x25x25cm for a large bat species. As a general rule the size of the cage should be twice the length of the bat's wingspan.
- ✓ 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?
 - 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 the bat with an opportunity to move towards or away from the heat depending on its recovery.

○ 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.
- ✓ A small amount of tinned cat or dog food has been used by some individuals in an emergency. However mealworms are the favoured food – if an animal is to stay for more than one day in care.
- ✓ Mealworms are used by most rehabilitators for feeding bat casualties.

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.
- ✓ 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.
- ✓ Keeping the bat warm during feeding will help aid digestion and speed up recovery.

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.

Babies

- ✓ As a very short-term measure baby bats can be fed on goat's milk – administered with a fine paintbrush or a small plastic syringe.
- ✓ Most rehabilitators use Esbilac as a longer-term substitute for a mother's milk.
- ✓ Feeding should be little and often to begin with; a very shallow dish of water left in the cage with the baby will allow the baby to drink in between these times.
- ✓ A baby bat must be kept warm – a minimum of 25°C and a maximum of 35°C are suggested in the [Bat Rescue Manual](#).
- ✓ When the time is right a baby bat can be slowly weaned onto mini mealworms.
- ✓ Please note that choosing to rear a baby bat is extremely time-consuming and resource-intensive. The success of baby bat survival comes with experience. The choice to rear a baby bat should only be considered by or in conjunction with an experienced bat rehabilitator.



Rearing a baby bat is time-consuming and resource intensive

© Kay Bott

○ 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.
 - ◆ Cages may be made of washable netting or be specifically designed enclosures.
 - ◆ 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.
 - ◆ Care should be taken that the flight cage is secure to avoid escapes before the bat is ready for release.
- ✓ See [Rehab and release](#) section for more information.

- 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, so a record should be kept of its weight and/or condition.
 - ✓ 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](#).



A rehabilitator at a public event with permanent captive bats

© BCT

- Hibernation
 - ✓ Where possible any bats suitable for release should be released back into the wild as soon as possible to avoid overwintering. 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.
 - ✓ 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.
- ✓ 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.



Bat droppings

© Anne Youngman

○ 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.

○ Bat reared from a baby

- ✓ A bat which was brought into care as a baby and is ready for release will still need to satisfy the above criteria.
- ✓ 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. This requires several weeks of free access to a flight area in which there are opportunities to catch flying insects.

Release

Check list	
Release	
Location	✓
Timing	✓
Weather conditions	✓
Height	✓

- 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 their 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?
 - ✓ 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 ecosystem/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.
- Baby bat release
 - ✓ A baby bat needs to be found by its mother if it is going to stand a chance of surviving in the wild. It is therefore extremely important to locate the roost site.
 - ✓ The bat may need to be taken into care if it is discovered during the daytime; the bat will need to be kept warm and possibly rehydrated.
 - ✓ 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.
 - ✓ It is important that the baby is kept warm throughout and is in an open container into which the adult can fly, but which is too deep for the baby to escape from.
 - ✓ 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 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 in the next evening.
- 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.

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,
 - ◆ The Conservation (Natural Habitats, &c.) Regulations 1994 (amended).
- ✓ A bat can be taken into care for the purpose of release back into the wild.
- ✓ 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 Act 2006
 - ◆ “Introduces legal requirements on people who are responsible for animals, effectively setting standards of care for those animals”,
 - ◆ For more detailed information about the act please refer to the “[Animal Welfare Act 2006 – guidance for wildlife rehabilitators, RSPCA 2007](#)”.

○ Licensing

- ✓ New legislation

The licencing process for the possession of wild bats is still evolving and the relevant [SNCO](#) should be contacted for up-to-date information. At the present time, in England and Wales:

 - ◆ Captive bats must now be licensed and justified,
 - ◆ Keeping of dead bats will be licensed (General licence).

Scotland and Northern Ireland are still confirming their policy; please refer to the [reference section](#) for more information.
- ✓ 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.
- ✓ Contacts for more info ([SNCO](#) or [BCT](#)).

○ 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.

○ 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,
- ✓ Examine a bat and assess its condition and health,
- ✓ Safely release a captive bat,
- ✓ Assess when a bat requires euthanasia,
- ✓ Set up and maintain a recording system.



Measuring a noctule

© Alan Roe

Further information, support and references

Contacts

- Bat Conservation Trust
15 Cloisters House
8 Battersea Park Road
London SW8 4BG
Helpline 0845 1300 228
- Countryside Council for Wales
Maes y Ffynnon
Penrhosgarnedd
Bangor
Gwynedd LL57 2DW
0845 1306 229
- Environment and Heritage Service
(Northern Ireland)
Klondyke Building
Cromac Avenue
Gasworks Business Park
Lower Ormeau Road
Belfast BT7 2JA
- Natural England
Northminster House
Peterborough PE1 1UA
0845 600 3078
- RSPCA
Wilberforce Way
Southwater
Horsham
West Sussex RH13 9RS
Advice line 0300 1234 555
- Scottish Natural Heritage
Great Glen House
Leachkin Road
Inverness IV3 8NW
01463 725000
- Veterinary Laboratories Agency
Rabies Diagnostic Unit
Woodham Lane
Addelstone
Surrey KT15 3NB
- West Yorkshire Bat Hospital
10 North Avenue
Otley
West Yorkshire LS21 1AJ



Brown long-eared bat in gloved hand

Further reading

- **A Field Guide to British Bats**
Greenaway, F., Hutson, A.M. 1990. Bruce Coleman Books, Uxbridge, Middlesex
- **A Guide to British Bats**
Jones, K., Walsh, A. 2001. Field Studies Council
- **Animal Welfare Act 2006 – guidance for wildlife rehabilitators**
RSPCA 2007. Available to download at:
<http://www.rspca.org.uk/servlet/ContentServer?pagename=RSPCA/RSPCARedirect&pg=WildlifeReportsandResources>
- **Bat Rescue Manual**
Maggie and Bryan Brown 2006. Available from the West Yorkshire Bat Hospital
- **British Wildlife Rehabilitation Council Guidelines for Wildlife Rehabilitation Unit**
British Wildlife Rehabilitation Council, 2007. Available to download at:
<http://www.bwrc.org.uk/>
- **BSAVA Manual of Wildlife Casualties (Bats section)**
Mullineaux, E., Best, R.T., Cooper, J (Eds) 2003. Available from Blackwell Science.
- **Captive Care and Medical Reference for the Rehabilitation of Insectivorous Bats.**
Loller A & Schmidt-French B 1998. Available from Bat World Publications, Texas, USA
- **Report of Bat Care & Rehabilitation Best Practice Workshop**
Bat Conservation Trust 2007
- **Which Bat is it? A Guide to identification in Great Britain and Ireland**
Stebbins, R.E., Yalden, D.W., Herman, J.S. 2007. Mammal Society.
- **Why wear gloves**
Bat Conservation Trust 2006, available from BCT



Serotine bat

© Shirley Thompson

Acknowledgements

The Bat Conservation Trust would like to thank the following people for their invaluable help in the production of this document

- All attendees of the BCT Best Practice Bat Care and Rehabilitation Workshop
- British Veterinary Association Animal Welfare Foundation (BVA-AWF)
- Maggie Brown (West Yorkshire Bat Hospital)
- Adam Grogan (RSPCA)
- Lesley Helliwell (Veterinary professional)
- Andrew Routh (Head Vet at London Zoo)
- Royal College of Veterinary Surgeons Trust (RCVS)



Soprano pipistrelle young adult and Leisler's pup

© Hazel Ryan

Bat Conservation Trust



15 Cloisters House
8 Battersea Park Road
London SW8 4BG
Telephone 0845 1300 228
Fax 020 7627 2628
Email enquiries@bats.org.uk
www.bats.org.uk

Registered charity number 1012361,
company limited by guarantee number 2712823