

Focus on bats

discovering their lifestyle and habitats

English Nature is the Government agency that champions the conservation of wildlife and geology throughout England.

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Bottom left: Serotine bat.
S.C. Bisserot/Nature Photographers
Main: Pipistrelle bat in flight.
H. Clark/FLPA



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Focus on bats

Bats are the only true flying mammals. Like us, they are warm-blooded, give birth and suckle their young. They are also long-lived, intelligent and have a complex social life. Although they're often called flying mice, they're not closely related to mice but form a special group of their own: the Chiroptera. Worldwide, there are almost 1,000 different sorts of bat, ranging from the tropical flying foxes, with a wing-span of almost two metres (six feet), down to the hog-nosed bat of south-east Asia, which is little bigger than a large bumblebee. In Britain there are only 16 species, all of which are small and eat insects.

In many parts of the world, including Britain, bats have declined drastically in recent years. Although we don't have much historical information, it's clear that our bats are under threat and many species are now much less common than they were. One species, the mouse-eared bat, is more or less extinct in Britain and several others are very rare.

Greater horseshoe bat, one of our largest species.
Stephen Dalton/NHPA



Brown long-eared bat. F. Greenaway

What's special about bats?

Bats are highly specialised and remarkable animals with some amazing features:

Wings

Bats' wings are made out of a soft and elastic membrane of skin stretched over the arms and legs. Bats have the same bones in their arms as us but their hand bones are much longer. Because their arms and legs help to support the wings, bats find it easiest to hang upside down when they're roosting. Some species wrap their wings around themselves like a cloak when they're asleep.

Sonar

Although bats certainly aren't blind, eyesight isn't much good for hunting insects in the dark. Bats have developed a highly sophisticated echolocation system that allows them to catch tiny insects and avoid obstacles, even in complete darkness. When they're flying, bats produce a stream of high-pitched squeaks and listen to the echoes to produce a 'sound picture' of their surroundings. Most of these echolocation squeaks are too high pitched for us to hear, and the mystery of how bats avoid obstacles in the dark was solved only about 50 years ago. Now, many enthusiasts have electronic bat detectors that pick up the bats' squeaks and turn them into sounds that we can hear.



Whiskered bat and Natterer's bat in hibernation. The bats are so cold that condensation forms on their fur. Tony Mitchell-Jones/English Nature

Hibernation

There aren't many insects around during the winter so insectivorous animals have to change their ways. Birds migrate south to warmer climates, but our bats have perfected a different technique - they hibernate. During the autumn, bats put on weight and then, as the weather gets colder, they let their body temperature drop to close to that of their surroundings and slow their heart rate to only a few beats per minute. This helps their food reserves last as long as possible. In this state, bats can't wake up quickly to move out of danger, so they choose undisturbed places to hibernate. Surprisingly, bats don't sleep right through the winter but may wake up and go out to feed and drink on mild evenings when some insects are about. Even on very cold nights, bats may be seen on the wing as they move to more sheltered roosts. Flying in winter uses up lots of energy which the bats can't easily replace, so hibernating bats should not be disturbed as this might affect their chances of surviving the winter.

Bats have much better control over their body temperature than other hibernating animals, such as hedgehogs or dormice. Even during the summer, bats can let their body temperature drop during the day when they're in their roosts. This helps to conserve energy, so bats can sleep their way through periods of bad weather when other small animals might starve to death.

Feeding

In cool climates, such as Britain, bats eat only insects, which they catch in flight or pick off water, the ground or foliage. Some bats specialise in catching large insects such as beetles or moths but others eat thousands of very small insects, such as gnats, midges and mosquitoes, every night. Bats gather to feed wherever there are lots of insects, so the best places for them include traditional pasture, woodland, marshes, ponds and slow-moving rivers.

Breeding

Our bats have a unique and fascinating way of fitting their breeding cycle in with hibernation. They mate during the autumn or winter, but the female stores the sperm alive in her body and becomes pregnant the following spring. Pregnancy lasts for six to nine weeks and can vary in length depending on the weather. Usually only one baby is born each year. This is looked after carefully and suckled for between four and five weeks until it is old enough to fly out and hunt for itself. Bats don't bring food back to the roost to feed their

young, so the baby lives only on its mother's milk until it is old enough to fly.

Lifespan

Compared with other small animals such as shrews and mice, bats are amazingly long lived. They can live for over 25 years in the wild - a remarkable feat for an animal weighing less than 10 grams! Perhaps this is because they spend more than half their lives asleep or because they breed so slowly.

How do bats live?

Most bats form social colonies for at least part of the year. Female bats gather together in maternity colonies for a few weeks during the summer to give birth and rear their babies. Once the baby is independent, the colony breaks up and the bats generally move to other roosts. Bats may gather together from over a large area to form these colonies, so any disaster at this summer breeding site can wipe out all the females from this area. During the winter, bats aren't often seen but clusters of hibernating bats are occasionally found in hollow walls when buildings are demolished, and are sometimes seen in buildings such as churches. Underground places such as caves, mines and cellars can house important numbers of bats during the winter and a few special sites are used by several hundred bats for hibernation.



Hibernating lesser horseshoe bat. F. Greenaway

Where do bats live?

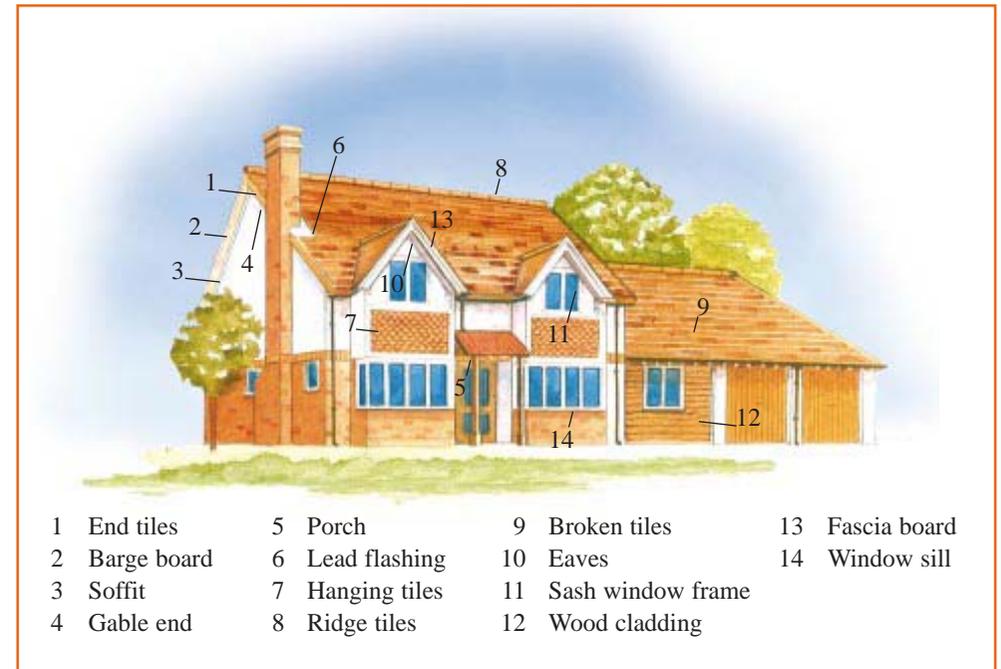
During the summer, bats fly out to feed on insects at night and then spend the day in their roosts. In winter, they hibernate for long periods in sheltered places. Although bats can be found in all sorts of places, there are three main types of roost:

- Buildings, including houses, churches, farms, ancient monuments, fortifications and all sorts of industrial building. These are most important in summer, but some are used throughout the year.
- Caves, mines and other underground places like cellars, ice houses and tunnels. These are most important for hibernation as they give the sheltered and stable conditions that bats need.

- Hollow or damaged trees. Bats roost in cavities or under loose bark throughout the year.

Each species has its own preferred types of roost. Some are almost always found in buildings, others rely on buildings during the summer and caves or mines during the winter whilst others prefer trees. Bats have well-established traditions and they tend to return to the same sites at the same time year after year. For this reason, their roosts are legally protected even if the bats don't seem to be there when you look.

Barbastelle bat, one of our rarest species.
S.C. Bissierot/Nature Photographers



It's not particularly common for bats to use the same roosting place throughout the year, as they need different conditions for breeding and hibernating. If bats are present during the summer, it's often possible to see them fly out at dusk or perhaps even hear them inside the roost on hot days or before they emerge in the evening. Often, though, you will have to look for signs of bats rather than the animals themselves. The most characteristic signs are droppings. These are roughly the size and shape of mouse droppings, but they crumble to a powder when dry, and they're generally found either stuck to walls or in small piles beneath where the bats hang or beneath the roost exit.

Bats in buildings

With the clearing of Britain's woodland, bats have had to adapt to living in buildings. Many species now rely heavily on buildings for roosting, so their conservation depends very much on our tolerance and goodwill.

Bats are usually temporary seasonal visitors to houses, a little like house martins. They normally form maternity colonies during May or June and then leave during July or August once the young bats are independent. The colonies tend to be most obvious during early July, when the young are starting to fly, but soon after this the adults will start to leave,



Pipistrelle nursery colony in a house roof. The young bats are grey. R. E. Stebbings/NHPA

followed by the young. Of course, different species have slightly different habits, but this seasonal pattern of use is common to all.

The average bat maternity colony found in Britain contains about 50 bats and the largest colony ever found contained well over 1,000.

Bats choose their roosts quite carefully. During the summer, they look for sites which are warmed by the sun, so they are most often found on the south or west sides of buildings. Most species prefer to roost in quite

small spaces and they're not usually found in open draughty areas like barns. Pipistrelles, our smallest and most common species, are almost always found roosting in the eaves or under hanging tiles or wooden cladding on the outside of buildings rather than in the loft. Pipistrelles colonise new buildings quite readily, so many colonies are in houses built since the 1960s. By contrast, brown long-eared bats, another widespread species, prefer older buildings where they are most often seen in a small cluster at the top of the roof ridge inside the loft.

Conservation

Most bat colonies live quite happily with their human landlords, but occasionally problems or concerns arise. However, most colonies are seasonal visitors and will leave of their own accord within a few weeks. If you are unsure about having bats in the roof, you must ask for advice from English Nature before doing anything yourself. Although it's illegal to kill bats, nobody has to have them in their home if they really don't want them and we'll give free advice on how to solve any problems.



Bechstein's bat. F. Greenaway

Droppings

Bat droppings can be unsightly, though in Britain there is no known health risk associated with them. In the loft, the simplest and most cost-effective measure is to cover stored goods with dust sheets, which can be brushed off every now and again. Outside, droppings stuck to walls and windows are usually a temporary seasonal problem, but deflector boards fitted above doors or windows can provide a solution.

Disease

British bats have few diseases that could affect humans and problems are very rare indeed. In recent years a tiny number of bats have been detected with a rabies-like virus called European bat lyssavirus, which can infect humans, so, for this reason, you are advised to avoid skin contact with bats or bats' saliva. Bats rarely come into contact with people, but if you are bitten or scratched by a bat you should seek immediate medical advice. Having bats in your roof carries no risk from this virus.

Bats in rooms

Bats generally come and go from their roosts without any trouble, but occasionally they turn up inside the house. This seems to be most common when baby bats, which are tiny and grey, crawl out of their roost and find a way into the rooms, but there are also cases of young, inexperienced, bats flying in through

windows by mistake. If a bat is flying inside a room, open doors or windows to allow it to escape. If it has settled, remember that you are advised to avoid direct contact with bats and seek advice from your nearest English Nature office or the BCT UK bat helpline on 0845 1300228. If you need to remove a bat from a room or anywhere else, place a small box or other container over the bat and slide a piece of cardboard underneath to trap it. Alternatively, cover the bat with a soft cloth or towel and gather it up carefully. In both cases you should wear gloves. Carry the box or cloth outside and release the bat away from houses, cats and people, preferably at dusk. If more than one bat turns up inside, it's most likely that they're crawling through from the nursery roost, so block up any holes around pipes or gaps around ceilings or floors from inside the house. If you're not sure what to do, phone English Nature, your local Bat Group or Wildlife Trust for advice.

Noise or smell

Problems of noise or smell are uncommon but may need specialist advice. Large colonies of pipistrelles can be noisy during the summer, especially if they're behind cladding outside a bedroom window, but this only lasts for a short time before the colony begins to move out. Bat droppings do not normally smell strongly, but can do if they get wet, either because they're in a very

confined space with little ventilation or because a building defect allows rainwater in. Consult English Nature before taking any action.

Damage

It's almost unknown for bats to cause any damage to houses. Unlike birds, they don't bring in material to build nests and, unlike mice, they don't gnaw wood, electric cables or entrance holes but merely take advantage of existing gaps or holes. Once inside the roost they cling onto the timbers or squeeze themselves into cracks and crevices. Most bat colonies are small, with the average colony of 50 bats weighing in at well under 500 grams (1 pound).

Repairs, re-roofing and alterations

Because they depend so much on buildings, bats need our tolerance and help to survive. Mostly this is just a matter of leaving the bats undisturbed, but repairs, maintenance and alterations to buildings can affect bats and their roosts. In these cases, a little forethought can usually minimise the problems. Remember that the law says you must tell English Nature before you do anything that would affect bats or their roosts in your house.

If you think you have a bat roost in your house and want to carry out work such as re-roofing, roof repairs, alterations in the loft, wall repointing or repairs to eaves or cladding that

might affect the bats, you must tell English Nature before starting. In most cases, it's just a matter of organising the timing of the work to avoid the bats breeding season. We may also ask if you would be willing to leave access points so the bats can return in following years.

If you want to carry out works that might affect bats or their roosts in situations that are not dwelling-houses you may need a licence from the Department for Environment, Food and Rural Affairs (Defra).

Remedial timber treatment

Treatment for woodworm or rot can be a major hazard to bats if carried out with the wrong sort of chemicals or at the wrong time of year. Older-type insecticides, such as lindane, leave a poisonous deposit on the treated surfaces which can kill bats even if they're not present at the

time of treatment. Fortunately, the situation is now much improved since the introduction of more modern insecticides like permethrin, which are much less poisonous to mammals. However, timber treatment still shouldn't be carried out where bats are present, so if you think bats use the building, tell your timber treatment company and consult English Nature for advice about the type of chemicals to use and when to apply them.

Burglar alarms

Sometimes bats flying in buildings can set off burglar alarms, including those that use light beams, microwave or ultrasonic detectors or passive infra-red sensors. Persistent problems can usually be solved by moving the detectors, installing additional sensors or changing the system, for example to modern pulse-count detectors, which are resistant to false alarms.

Daubenton's bat, emerging from tree hole. Hugh Clark/FLPA



Churches

Most churches, certainly in southern England, are used by bats at some time of the year, though they're rarely found in belfries, which are too exposed and draughty. In most cases, the number of bats seems small and the only problem is a scattering of droppings, which can easily be swept away. Occasionally, urine spotting appears on brass, marble or polished surfaces. This can be minimised by treating floors or polished surfaces with an emulsion wax polish, and brass with a strippable lacquer. A few churches may have larger numbers of bats and, here, specific advice on the management of the colony may be needed.

Greater horseshoe bat in flight.
Stephen Dalton/NHPA



Bats out of doors

Underground

Many bats rely on underground sites such as caves, mines, tunnels, cellars and ice houses for hibernation or, occasionally, breeding. Unfortunately, these sorts of places are sometimes blocked up for safety reasons or by people dumping rubbish, so bats either lose their hibernation site or, worse still, are sealed up inside. If you're planning to block, cap, grille or demolish any sort of underground place which might be used by bats, consult English Nature before starting work. Also, try not to go into such places during the winter if you think bats may be hibernating there.



Bat boxes on trees in Cambridgeshire. David Warren/FLPA

Hollow and damaged trees

These are important for bats and other wildlife but they're often 'tidied up' without thought for their value. Hollow or damaged trees should always be left standing if possible or made safe by the lopping of branches. Even hollow branches on healthy trees can be important for bats.

Helping bats

Here are some ways in which people can give bats a helping hand.

House roosts

You can make your house accessible to bats by providing holes in the right places but it's just a matter of chance if bats find them. Access holes should be no larger than 20 mm wide and the best places to put them are along eaves near the corners of buildings or at gable apices.

Bat boxes

These are like bird boxes but with an entrance designed for bats. It's best if they're put up on trees in an area such as a conifer plantation where there are lots of insects but no natural roosts for bats. Bats will sometimes use boxes on houses, but don't be disappointed if the box appears to stay empty. They should be put as high up as possible, facing south. Your local bat group will be able to advise, or contact the Bat Conservation Trust or English Nature for a leaflet.

Bat grilles

Underground sites, such as caves, mines, cellars or tunnels, can be protected with specially designed grilles which will keep people out but allow bats in. These need to be built to a tested specification and fitted carefully. If you know of a site that needs protecting, contact English Nature for detailed advice.

Bats in the garden

Planting a wildlife garden can help to provide the insects that bats need, especially if there's a pond and night-scented flowers and shrubs.

Bat groups

Most counties have local bat groups which are involved in a range of practical conservation projects to help bats. New members are always welcome, so ask the Bat Conservation Trust for the name of your local contact.

Identifying bats

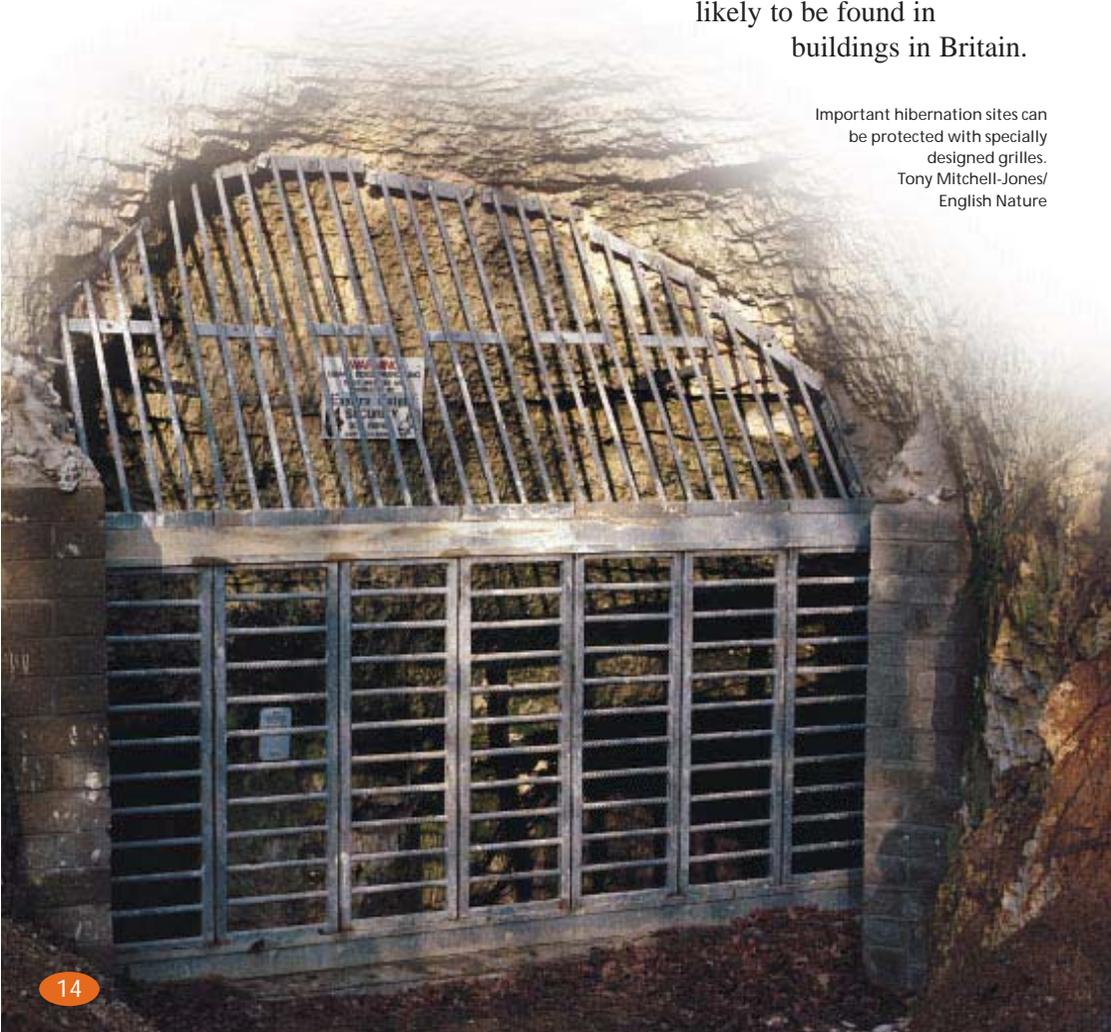
Even experts find bats difficult to identify, as most species look quite similar. The ones that stand out from the crowd are long-eared bats, whose ears are almost as long as their bodies, and horseshoe bats, which sleep hanging upside down with their wings wrapped round their bodies like a cloak.

In the following table, species are listed in the order in which they're likely to be found in buildings in Britain.

Important hibernation sites can be protected with specially designed grilles.
Tony Mitchell-Jones/
English Nature

Britain's bats

Species in houses	Frequency	Main distribution	Main roosts
Common pipistrelle	Common	Throughout Britain	Buildings, trees
Pygmy pipistrelle	Common	Throughout Britain	Buildings, trees
Brown long-eared bat	Common	Throughout Britain	Buildings, trees
Serotine	Local	Southern England	Buildings
Lesser horseshoe bat	Local	South-west England and Wales	Buildings, underground sites
Natterer's bat	Uncommon	Throughout Britain	Buildings, underground sites
Whiskered bat	Uncommon	England and Wales	Buildings, underground sites
Daubenton's bat	Uncommon	Throughout Britain	Buildings, underground sites
Noctule	Uncommon	England and Wales	Trees
Greater horseshoe bat	Rare	South-west England and Wales	Buildings, underground sites
Leisler's bat	Rare	England	Buildings
Brandt's bat	Rare	England and Wales	Buildings, underground sites
Barbastelle	Rare	England (south)	Trees, underground sites
Grey long-eared bat	Very rare	Southern England	Buildings
Bechstein's bat	Very rare	Southern England	Trees, underground sites
Nathusius' pipistrelle	Very rare	Throughout Britain?	Buildings
Greater mouse-eared bat	Extinct?	Southern England	Buildings, underground sites



Bats and the law

All bats and their roosts are fully protected by the Wildlife & Countryside Act 1981 (as amended) and the Conservation (Natural Habitats &c.) Regulations 1994.

You must not

- Intentionally or deliberately kill, injure, catch or keep bats
- Damage, destroy or obstruct bat roosts
- Disturb bats, for example, by entering known roosts or hibernacula
- Sell, barter or exchange bats, alive or dead

Trees like this dead oak provide valuable roosting places for bats.
Walter Rohdich/FLPA



You must

Consult English Nature before you do anything that might affect bats or their roosts. This might include:

- Blocking, filling or installing grilles over old mines or tunnels
- Building, alteration or maintenance work
- Getting rid of unwanted bat colonies
- Removal of hollow trees
- Re-roofing
- Remedial timber treatment
- Re-wiring or plumbing in roofs
- Treatment of wasps, bees or cluster flies

Remember that because bats return to the same places year after year a bat roost is protected even if there aren't bats there all the time.

The law allows you to tend disabled bats, kill seriously injured ones and disturb bats in the living area of a house. Other activities, such as catching, ringing or photographing bats or disturbing them whilst roosting, can be licensed by English Nature provided they are for scientific, educational or conservation reasons.

Brown long-eared bat in flight. Stephen Dalton/NHPA



If you need to carry out activities, such as development of any sort, which might affect bats or their roosts, you may require a licence from the Department for Environment, Food and Rural Affairs. Contact Defra at:

European Wildlife Division
Defra
Temple Quay House
Temple Quay
Bristol BS1 6EB
Tel: 0117 372 8903

This explanation should be regarded only as a guide to the law. For further details, reference should be made to Sections 9-11, 16-27 and 69 of the Wildlife and Countryside Act 1981 or Regulations 38-46 of the Conservation (Natural Habitats &c.) Regulations 1994.



Brown long-eared bat in house roof. John Hawkins/FLPA

Further reading

Bat boxes, R E Stebbings & S T Walsh, Mammal Society.

Bats in houses, Bat Conservation Trust.

Bats in the garden, Shirley Thompson, School Garden Co.

Bats, Phil Richardson, Whittet Books.

These and many other publications are available from the following organisations, which have a special interest in bat conservation:

Bat Conservation Trust
15 Cloisters House
8 Battersea Park Road
London
SW8 4BG
Tel: 020 7627 2629

The Mammal Society
15 Cloisters House
8 Battersea Park Road
London
SW8 4BG
Tel: 020 7498 4358

The Vincent Wildlife Trust
3&4 Bronsil Courtyard
Eastnor
Ledbury
Herefordshire
HR8 1EP
Tel: 01531 636441

Bats on the Internet

Bat Conservation Trust
<http://www.bats.org.uk>

Bat Conservation International
<http://www.batcon.org>



Noctule bat, a tree-dwelling species. Hugh Clark/FLPA