

Bats Underground

Specialist Support Series



This is intended as a guide for all those who might come across bats underground. It explains why bats use underground sites and how those visiting them can support bat conservation by being aware of bats and the issues related to them.

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Bats Underground

Why do bats use caves and underground sites?

Some species of British bat traditionally breed in underground sites and many rely on such places for at least part of their hibernation period. Bats also use these sites temporarily for a variety of purposes, such as for mating roosts or night roosts during feeding or inclement weather. In late summer and autumn nights hundreds of bats can 'swarm' at cave/mine entrances with males competing to attract females and mate.

Why are bats vulnerable?

Due to a decline in their numbers, all British bats are protected by law. Bats are particularly vulnerable to disturbance whilst breeding; they usually only give birth to a single pup each year, and so disturbing a maternity colony can have a significant adverse impact on the area's bat population. They are also vulnerable during hibernation, as frequent disturbance from torpor leads to a reduced chance of surviving the winter.

Which bat species are found underground?

Both greater and lesser horseshoe bats, which are some of the UK's rarest bat species, use underground sites for hibernating. They also infrequently breed in underground sites. Almost all of the other bat species found in the UK are known to hibernate underground.

Hibernation

All British bats feed on insects and are faced with the problem of surviving the winter, when the number of flying insects is greatly reduced. Therefore bats hibernate, seeking out undisturbed sites with low temperatures. Lowering their body temperature, heart rate, breathing and metabolic rates greatly reduces their energy requirements and allows them to exist on the body fat reserves laid down prior to hibernation. Many bats also require a humid environment to avoid dehydration, thus underground sites provide ideal conditions for hibernation.

Hibernating bats are unable to move quickly; it may take up to an hour for a bat to become warm enough to be fully active, and once the arousal process is started it is often irreversible. Bats have limited fat reserves to survive the winter period and each arousal uses a considerable amount of energy – possibly enough for ten days hibernation. Awakenings scheduled by their own internal rhythms or stimulated by natural conditions can be accommodated, but it is not easy to make up weight lost in winter. Any unplanned awakenings, for example by human disturbance, increase the risk of fat reserves running out before the winter is over. With little prospect of replenishing these

reserves, the bat may die through starvation or at least fail to recover sufficiently from hibernation to breed successfully.

Bats and the law

All bats and their roosts are protected by law. Bear the following Conservation Code in mind to stay on the right side of the law:

- Do not handle bats. This is illegal unless you have an appropriate licence.
- Beware of dislodging bats from their roosting position, particularly when you are moving through low passages.
- Camera flashes can be very disturbing – don't use them if bats are present (it is illegal to photograph bats without a licence to do so).
- Warming up hibernating bats can cause them to arouse from torpor. Try not to linger in confined spaces as even your body heat is sufficient to cause arousal.
- Do not shine bright lights on bats as this will cause them to wake from torpor. The use of carbide lamps in bat roosts is particularly undesirable because of the heat and fumes that they produce.
- Any strong stimulus can arouse bats so avoid smoking or making excessive noise underground.
- Do not take large parties into bat roosts in winter. Rescue practices should be avoided when bats are present.
- Seek advice before digging or blasting. Explosives can cause problems both from the blast itself and from the subsequent fumes. Sites used by bats need careful surveying to investigate whether or when certain works should occur. Digging operations may alter the microclimate of bat roosts by altering airflow.

Remember to consult with your Statutory Nature Conservation Organisation (SNCO) before undertaking activities.

Conserving bats in underground sites

The formations, archaeology and fauna of underground sites are all part of our national heritage, and all visitors to them should strive to maintain these sites. Always follow the safety and conservation codes published by the caving and mining history organisations and liaise with local groups over access and safety requirements.

Remember also that bats need your help to survive in the winter. Most hibernating bats are very difficult to see – many

squeeze into cracks and crevices and only the two species of horseshoe bats normally hang free. Just because you cannot see them does not mean that they are not there! You must seek advice about any activity that might affect bats from the local SNCO. Those visiting known bat sites for purposes such as recreation are asked to observe the Conservation Code and respect any special restrictions that have been placed on particular important bat sites. Disturbance can be very damaging, so only a limited number of people are licensed to disturb or handle hibernating bats in underground sites, and licences are issued by the relevant SNCO only after training has been given. Such licences are issued for controlled, carefully considered basic survey and monitoring, and occasionally for scientific research.

White-nose syndrome

White-nose syndrome (WNS) has been associated with the deaths of millions of hibernating bats in the USA (29 states) and Canada (five provinces), according to figures from the US Fish and Wildlife Service. In some hibernation sites, numbers have declined by 80–100% since 2006, when the condition was first identified. The fungus associated with WNS, *Pseudogymnoascus destructans* (previously called *Geomyces destructans*), has also been identified on a number of bats and at underground sites in Europe, including the UK, France, Germany, Switzerland, Hungary, the Czech Republic, Slovakia and other countries. However, unlike in the North America these findings have not been linked with mass mortalities and WNS has not been found in Europe. As part of your usual underground activities, if you see:

- bats with a white fungus, particularly around the nose, but also the wings, ears and/or tail;
- more than two or three bats flying outside between November and February; and/or
- dead or dying bats on the floor,

please notify the Bat Conservation Trust on: 0345 1300 228

Site protection

In the past, some sites that would otherwise have been lost to underground explorers were saved because of the presence of bats. Also many sites opened by cavers and underground explorers are now used by bats.

Many sites have been lost through sealing for safety or security purposes. Sealing should be regarded only as a last resort, to be undertaken when other methods of site protection are not possible or permitted. Liaison between interested parties can help preserve and protect such sites. Some underground sites are already protected for either nationally or locally important bat populations and many sites have been protected for other reasons but incorporate bat access.

Most sites remain unprotected and, while some will be protected in the future, the majority will rely on the goodwill and common sense of visitors to ensure their continued use by bats.

Site protection for bats normally consists of incorporating a grille into all or part of the entrance, allowing free access for bats but limiting human access. The extent of the grille will depend on the nature of the site and the air flow desirable. Such grilles are usually made of horizontal bars with a 150mm gap and vertical bars spaced at between 450mm and 750mm.

A smaller gap as little as 100mm by 250mm may allow access for bats, but may limit air flow to the extent that the site will not achieve maximum bat potential. This should only be used under extreme circumstances.

Guidance for those managing underground sites

- If there is no information on whether bats use a site, a bat survey should be undertaken.
- If a site known to be used by bats is to be grilled, gated or sealed, it is a legal requirement to consult the relevant Statutory Nature Conservation Organisation.
- Assume that all underground sites are used by bats. No site should be entirely sealed for protection; adequate access for bats should be incorporated wherever possible.
- Before a site is to be grilled for reasons of bat conservation, access arrangements for other interest groups should be negotiated with the owner and with conservation bodies and the local county archaeologist.
- Minor modification to existing site protection may improve the potential for bats.
- In the protection or preservation of any site, bat conservationists can offer advice, support, and sometimes influence as well as assisting with the physical work.

For further information

There are around 90 bat groups across the UK. Specific enquires or information about sites can be addressed to the bat group, details of which are available from the Bat Conservation Trust at: www.bats.org.uk/pages/local_bat_groups.html. Licensed bat workers are usually happy to have the company of underground explorers during bat surveys and monitoring work, and can demonstrate how inconspicuous bats can be as well as inform about their biology and conservation.

Lists of membership organisations are available from the National Association of Mining History Organisations (www.namho.org/), the British Caving Association (<http://british-caving.org.uk/>) and Subterranea Britannica (www.subbrit.org.uk/) can often assist with information about other miscellaneous underground sites.

For semi-underground structures such as lime-kilns and disused railway tunnels, the Association for Industrial Archaeology (<http://industrial-archaeology.org/>) may be able to help.

Statutory Nature Conservation Organisations

- Natural England <https://www.gov.uk/government/organisations/natural-england>
- Natural Resources Wales <https://naturalresources.wales>
- Scottish Natural Heritage www.snh.org.uk
- Northern Ireland Environment Agency www.ehnsni.gov.uk

Bat Conservation Trust

- National Bat Helpline: 0345 1300 228
- Website: www.bats.org.uk / Email: enquiries@bats.org.uk
- White nose-syndrome web pages: http://www.bats.org.uk/pages/about_bats-white-nose_syndrome-586.html