

## ***Recommendations for surveying bats in managed woodlands***

*(for owners/managers of woodland managed with conservation in mind)*

### **Introduction**

Trees and woodlands are very important habitats for all UK bat species. All UK bats are reliant in some way on woodland habitats, either for roosting, for foraging or for much needed cover as they move between key sites. Some bat species will use woodlands all year round for roosting (including rearing their young and hibernating) and for foraging. These bats are known as woodland specialists and include the rare barbastelle and even rarer Bechstein's bat, found only in the southern part of England.

All 17 species of bats found breeding in the UK and their roosts are protected under the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981 (amended). Further information about our UK bat species can be found on the Bat Conservation Trust (BCT) website <https://www.bats.org.uk/about-bats>.

This guidance is to help you survey woodlands for bats and understand how bats use your woodland.



Barbastelle bat  
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Brown long-eared bat  
© John Altringham

Natterer's bat  
© Hugh Clark

Noctule bat  
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### **Knowing if your woodland would support roosting and foraging bats**

It will help to have an understanding of bats foraging and roosting needs so you can gauge the likelihood of your woodland supporting bats.

For foraging, bats prefer:

1. A woodland that contains native tree species, together with a well-developed understorey and ground flora that can support diverse, abundant insect populations.
2. A mosaic of different habitat features, such as rides, wet woodland, high forest, deadwood, glades and tree-lined water corridors that support an insect diversity, providing food for a range of different bat species.
3. Plantation forests can support foraging bats provided they are not too densely planted and if rides and tracks support invertebrate rich vegetation.

For bats moving through the wider landscape, the following features are important:

1. Connectivity of the woodland to the wider landscape via hedgerows, shelter belts and river corridors, since most bat species generally avoid flying in the open where there is a greater risk of predators. Woodland that are connected by these linear features will have a higher chance of being used by bats for foraging, and this connectivity will provide suitable safe cover as they move through the countryside, particularly in the early dusk period.

Bats that roost in trees prefer:

1. Any tree that has crevices, cavities, splits, woodpecker holes and/or loose bark can provide a potential roosting site for bats. This can include younger trees and non-native species. However, a woodland that contains deciduous trees that contain mature and veteran trees are the best source of tree roosts, with oak most likely to be used by woodland specialist like the barbastelle and the Bechstein's bat.

If a woodland has any of the above, then there is good chance that bats will use it for roosting and/or foraging. Further information about bats and woodland can be found on the BCT website at [http://www.bats.org.uk/pages/bats\\_and\\_woodland.html](http://www.bats.org.uk/pages/bats_and_woodland.html).

## Surveying for bats

A desk study can help in determining whether a woodland has roosting and foraging potential and this can be carried out without extensive training or qualifications. Looking at species distribution maps (<http://jncc.defra.gov.uk/page-6391>) will give you the known ranges for the bats that use woodlands. Further records can be found on the National Biodiversity Network (NBN), using the interactive maps on the NBN atlas <https://nbnatlas.org/>. Though please note that these sources won't contain recent records and a lack of records does not indicate that there is an absence of bats in your area of search, it may be that no-one has surveyed for them. It is also worth getting in contact with your local Natural England office, Wildlife Trust, record centre or bat group to see if they have any records.

## Manual Bat Activity Survey

If you think your woodland is likely to support bats you may want to find out which species are present. A manual bat activity survey can be carried out to identify which species are present, as they commute or forage. This type of survey involves walking along a route through the woodland using a handheld detector and recorder. Along the way the surveyor observes and records bats as they fly through the woodland. This type of surveying helps to inform:

- Whether bats are present within the woodland
- Which bat species (or species groups) are using the woodland, and
- Where the main areas of bat activity are amongst those areas surveyed.

There is a range of different survey protocols and detectors that can be used for surveying bats in managed woodlands. Detailed survey guidance can be found in the Heritage Lottery Funded ***'Finding out more about how bats use your woodland'*** document.

## Static Survey

To learn about bats that are not often found using routes used for transects (but instead use the cluttered woodland interior), and to discover more about how bats are affected by long-term woodland management practices, or how they are using the different habitats within a woodland, it is recommended that long-term monitoring should be carried out. The best way to do this is to use static broadband detectors as most models can be positioned within the wood and set to record for many nights, reducing surveyor effort. A recent, successful Heritage Lottery funded bat monitoring project at Swanton Novers NNR used full spectrum, real-time static detectors which are the best option when surveying a woodland for bats as they can continuously record all frequencies (capturing a wider range of bat calls).

To collect bat data in a woodland using broadband static detectors, suitable monitoring points will need to be selected. These should be chosen to include a representative cross-section of habitats within the woodland. To compare bat activity in the rides with activity in the compartment interiors, ride monitoring points should also be selected. However, to monitor the activity of open or edge species like noctule and serotines, transect survey along woodland edges and rides is recommended. Although noctules roost in trees, they forage over open habitat and fly high above the canopy so are not easily picked up by static detectors.

Survey and monitoring schemes within woodlands should include coverage of the quieter interior areas. The Swanton Novers project dataset showed that a notable amount of bat activity was recorded at the interior monitoring points and most bat species used the woodland interiors, even edge species like the common pipistrelle. It is therefore recommended that future monitoring using static broadband detectors should include woodland compartment interiors to gain a better understanding of bat activity. This has not been standard practice up until now.

Where there is a possibility that the activity recorded is from bats passing through as they emerge out of a nearby compartment, roost, or woodland edge, more monitoring points situated in nearby woodland parcels or other woodland sites would be useful in helping to shed light on the source of activity recorded.

Surveying for bats in a woodland environment is dependent on surveyor availability, effort and equipment availability. Ideally monitoring should commence in April and continue until September. If possible monitoring through the autumn and winter months should also be considered, as some bat species are active throughout the winter if nights are mild enough for their prey to be available. This extended period of monitoring can be really informative as bats have different habitat requirements in summer and winter. Survey data relating to the winter period can, therefore, be critical to building up an understanding of the importance of different features in a woodland depending on what your questions are.

Depending on the species likely to be in your woodland, the woodland type and what you are trying to learn, there is the possibility that you may need to deploy two detectors at each or some of the monitoring points, one at ground level and one up in the canopy (Froidevaux et al., 2014). The Swanton Novers study confirmed that there was significantly greater level of bat activity recorded on the canopy detectors that were sited at 10 metres in the canopy, when compared to the ground level detectors which were placed on a pole 2.5 metres off the ground. This pattern was observed with the following individual species: barbastelle, common and soprano pipistrelles. Monitoring at ground level only should indicate the bat species present but if knowledge about a specific species

use, or where management could change the amount of canopy available, then at height monitoring should be considered. The need for at height monitoring can be decided on a case by case basis.

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Acoustic monitoring has its limitations and only provides a snapshot of activity for the period recorded. Quieter bat species may not be recorded and big bat species and myotis species can be hard to classify to species. Though Auto ID software is improving ground truthing may be required to identify some bat species in the hand. If required, trapping is an advanced bat survey option, but any trapping surveys will need to be carried out by bat workers with the appropriate project licence and experience.

### **Surveying Trees and Woodlands for Roosts – for a non-specialist**

It is important to minimise the risk of disturbing bats or damaging/destroying a roost, so woodlands should be assessed for roost potential before any management work commences. To do this, a scoping survey to look for potential roost features from the ground level should be carried out during winter/spring, when the leaves are not on the trees (allowing better views of potential roost features). Trees should be inspected thoroughly (all the way round, close up and from a distance) to look at features including those high up in the tree. Any potential features or sign of possible use should be recorded.

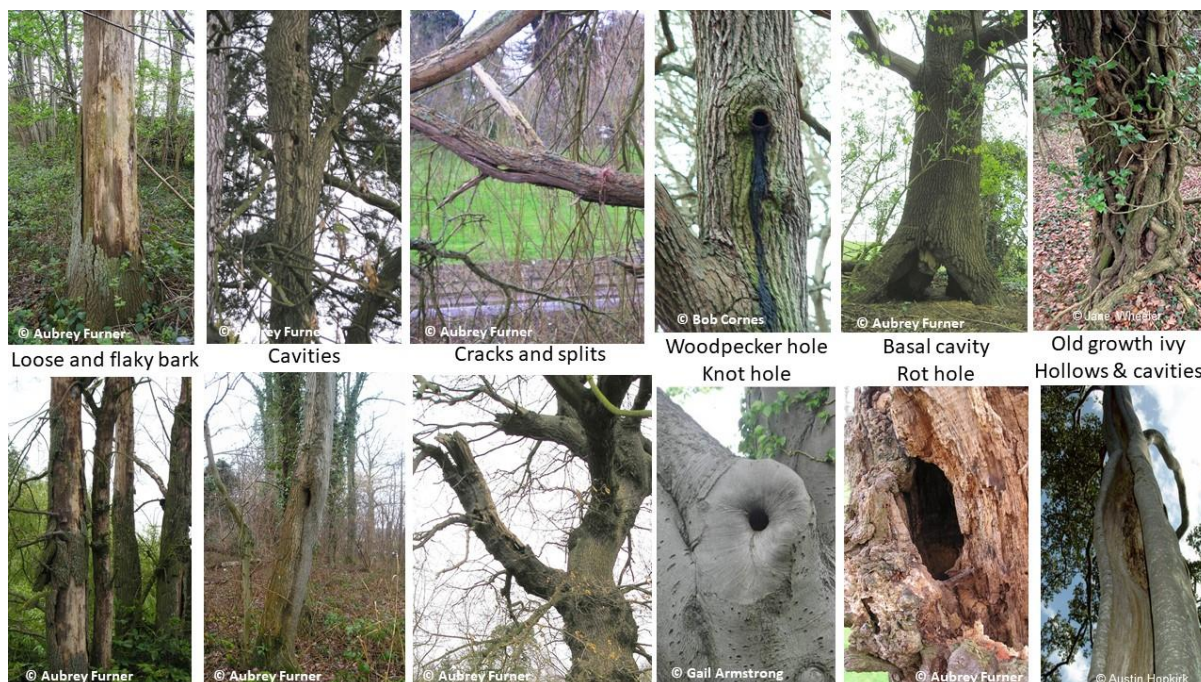
### **Where will you find tree roosts?**

Potential tree roosts can be found:

- In trees that are mature, preferably broadleaf trees. These older trees will have a better chance of supporting a potential roost feature and should be left alone to continue developing roost features. **However, younger trees and conifers should not be ignored, as many bat species, including small myotis and brown long eared will utilise smaller diameter trees and younger trees, especially if they have cracks, crevices, splits and holes.**
- In damaged trees, even younger trees if they have suffered some damage i.e. from lightning
- In woodpecker holes where the rot has extended the hole upwards.
- In cracks and crevices found in dead standing trees and snags.
- Behind loose or flaky bark and occasionally behind old growth ivy, if they have sufficient gaps behind the woody stems. Ivy has been used as a temporary roost by barbastelles.
- In tree hollows and cavities, knot holes, rots holes and basal cavities.

Features to look out which may have roost potential are shown in Figure 2.

**Figure 2: Examples of tree roost features**



Trees can then be categorised into the following categories (based on the categories provided by the British Standard [BS 8596](#) for surveying bats in trees and woodlands):

- **Known/confirmed roost** – if already known or signs of bats are found
- **High/medium risk** – with suitable roost feature, or several features that have bat potential.
- **Low risk** – no obvious potential features or with features that have little roosting potential.
- **Negligible/ no risk** - no suitable features and no bat potential.

If high or medium risk roost features are found to be present during a winter scoping survey, then a second survey should be carried out to ascertain if they have potential on closer inspection using a torch and binoculars to look at all potential features including those high up in the tree, or by an appropriately trained and qualified arborist. Ensure prolonged exposure to light from the torch is limited to avoid disturbing any potential roosting bats.

It might be that there is not a sufficient cavity or crevice in which case the likelihood of this being a potential roost tree can be downgraded. Consider leaving the tree undisturbed to develop potential roost features, but if work is required, then this can continue, though the contractors should have an understanding of what to do if a bat roost is found during any tree work. **Do keep a record of all the decisions you have made and ensure suitable emergency procedures are in place.** If a bat roost is found during any tree work, stop all work and contact Natural England (0300 060 3900) or the Bat Conservation Trust (0345 1300 228).

If unsure and you are unable to downgrade to low risk, in the summer consider watching and listening at dusk with a bat detector to see if bats emerge. You can also (a) survey at dawn when the bats are easier to see entering their roost, or (b) use equipment like infrared cameras to monitor activity around the tree. Look for signs of bats - In the daytime check to see if there are droppings

associated with the potential roost. Before dusk, some bat species make audible social noises before emerging which are easy to hear. At all times ensure you are not carrying out any invasive activity that could disturb bats using a roost. Therefore to carry out this secondary survey it is advised that some basic bat training should have been undertaken.

If a tree feature has high/medium bat roost potential and you cannot rule out use by bats AND if planned management work is going to impact the tree in question, a further survey by a licensed bat specialist will be necessary and if confirmed as a bat roost, a European Protected Species licence will be required from your Statutory Nature Conservation Organisation (SNCO), which will need the input of a licensed bat worker. Contact the Forestry Commission for further advice on this process.

If a tree has high/medium bat roost potential but is not a confirmed bat roost, do consider if the work can be avoided and the management plan can be adapted. It is advisable to avoid felling and disturbance to trees with bat roost potential if the woodland only has a few trees offering potential roosts.

Generally the recommendations above should be used in conjunction with best practice as set out in the Natural England/Forestry Commission document below and the British Standard BS 8596 for surveying bats in trees and woodland. If followed this should avoid the need for a licence as impacts on roosting bats will be avoided.

Further information on best practice can be found in the 'Guidance on managing woodlands with bats in England' document on the GOV.UK website: [https://www.forestry.gov.uk/pdf/england-protectedspecies-bats.pdf/\\$FILE/england-protectedspecies-bats.pdf](https://www.forestry.gov.uk/pdf/england-protectedspecies-bats.pdf/$FILE/england-protectedspecies-bats.pdf).

## **Further reading**

BS8596: Surveying for Bats in trees and woodland – Free micro Guide for non-specialists.  
<https://shop.bsigroup.com/forms/Bat-Microguide--BS-8596--BSI-Group/>

Woodland management for bats  
[https://cdn.bats.org.uk/pdf/Our%20Work/WoodlandManagementForBats\\_web.pdf?mtime=20181101151521](https://cdn.bats.org.uk/pdf/Our%20Work/WoodlandManagementForBats_web.pdf?mtime=20181101151521)

## **References**

Froidevaux, J.S., Zellweger, F., Bollmann, K. and Obrist, M.K., 2014. Optimizing passive acoustic sampling of bats in forests. *Ecology and evolution*, 4(24), pp.4690-4700.