

Bat Conservation Trust



Bat Roost Tree Tag Guidelines



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Introduction

Woodland owners, managers, and contractors on the ground often have difficulty locating and distinguishing trees that have been identified as a bat roost. Changes of ownership and site managers over the years can lead to information being misplaced and result in the accidental loss and damage of important bat roosts. It is also acknowledged that re-locating the tree in question can be difficult for bat workers, ecologists and others working with trees in woodlands.

The primary purpose of the bat roost tree tag scheme is to ensure trees containing confirmed bat roosts are easily identifiable. The presence of a tag on a tree is well recognised by woodland workers and site managers, so providing a bat roost tree tag will bring clarity to those on the ground about those trees already identified as bat roosts that are difficult to find again, especially as GPS units will have reduced accuracy in a wooded environment. When a woodland operative sees a tag and their actions may impact the tree, they will know they need to seek appropriate advice before proceeding with any work. This will give a significantly increased level of protection for bat roosts in trees.

Additionally, all tree roost and species records collected through the scheme will support current and future work studying bat's use of different tree species and roosting opportunities.

The Extent of Coverage

The Bat Roost Tree Tag Scheme (BRTTS) will be rolled out in England and Wales during 2021, then once established to the rest of the UK.

Landowner Permission

- Please seek permission from the landowner before commencing with any tagging or surveying. It is important to ask permission from the landowner before tagging any confirmed tree roosts, whether it is on the public forest estate or private land. A permission form can be downloaded from [here](#).
- If there is no public access, please seek permission from the landowner to enter the woodland.

BCT would like to build a positive relationship with landowners and site managers. Tagging a tree roost, surveying or entering a private woodland site without permission could generate negative views towards bats, which is not good for bat conservation, so it is important to seek permission beforehand.

The surveyor should keep a copy of the completed permission form for their records and share a copy with BCT. As we value and respect the privacy of every landowner or custodian and are committed to protecting their personal data, a privacy notice for landowners can be downloaded as a separate document from [here](#). This can be shared with the site owner.



The Bat Roost Tree Tag

The bat roost tree tag will become a known, recognisable tag that will eventually be the industry standard. Each tag will have the wording Bat Roost, a logo and a unique number that relates specifically to the roost. It will display a web page address where it will be possible to access general information.

Each tag is 80 mm x 60 mm in size and 1.2 mm thick and is made of anodised aluminium. Silver text is against a blue background.

When to use the tags

Tags should only be placed on confirmed tree roosts (maternity or hibernation, day or night or male roosts) where live bats, dead bats or bat droppings have been found, as they are the only conclusive evidence that the tree is used by bats.

Confirmation of the tree roost should be carried out by a surveyor with bat survey experience i.e. a professional or voluntary bat worker. In most cases tree roosts will be identified from emergence and dawn counts, surveys of potential tree roost features using an endoscope and occasionally from radiotracking surveys.

We recommend when seeking permission, that the landowner/manager is asked about any planned management or tree safety work onsite to ensure areas likely to be impacted by management are prioritised for tagging.

Tags should not be placed on trees with high or medium bat roost potential until appropriate surveys have been carried out to confirm the status as an actual roost.

Although tags cannot be fixed to trees with high or medium bat roost potential (only on confirmed bat roosts), it is important to ensure these potential roost trees are protected and retained where possible. Retaining these trees will also provide a continuity of potential roost features for the future. This can be done by:

1. retaining dead and dying trees with suitable features (i.e., crack, loose bark, woodpecker holes).
2. avoiding felling and disturbing any high or medium potential roost tree where there are only a few trees offering roost potential.
3. only felling a proportion of potential roost trees in any 10-year period where there is an abundance of suitable potential roost trees.
4. leaving a significant proportion of the area undisturbed within a 10-year period, when felling or thinning woodlands with an abundance of suitable potential roost trees.

Encouraging a diverse age structure will provide a range of different aged trees that will supply suitable roosting sites long term. Further information on managing woodlands with bats can be found on the [GOV.UK website](https://www.gov.uk).

Whether trees with potential are surveyed to confirm they are a roost is a decision for the landowner/site manager to make. Specialist bat roost assessment should be undertaken on any tree with high /medium potential if work to a tree cannot be avoided.

Placement of the tag and how to attach it to the tree

- The tag should be placed on the tree at head height or as high as you can reach (to avoid the need to climb or use a ladder) and be fixed in place with the two 2.5 cm long aluminium nails provided.
- The aluminium nails supplied should be used because they are less toxic to the tree than copper or steel nails, and they will not damage chainsaws or cutting blades. Ensure the nails are hammered 2 cm into the tree allowing for a little space behind the tag to remain. This will allow the tree to continue growing without engulfing the tag within its bark.
- If the roost entrance/exit is at head height the tag should not be placed anywhere near the roost feature itself, to avoid drawing attention to it. Consider fixing the tag lower down the tree or on the other side of the trunk.
- If the feature is a loose plate of bark, do not hammer the tag into this fragile and transient bark. Instead, the tag should be fixed somewhere else on the tree, if possible.
- If the tree roost is near a public right of way or anywhere near where the public congregates, make sure the tag is fixed on the tree facing away from the path or from a direct line of view. If none of the above is possible, and there are concerns regarding the tree roost proximity to the public then the tagging of the tree may need to be reconsidered and the risks balanced with the risk of the untagged tree being damaged or felled.
- If the roost is in a small tree and there are concerns that the tag is too large, making the tree roost too obvious to the public, then the tagging of the tree may need to be reconsidered.
- The surveyor will know the woodland site better than anyone else. If there is any likelihood of criminal damage to the tree roost, then tagging of the tree may need to be reconsidered.

A note for Woodland Owners and Managers

As the guidelines are aimed at surveyors with bat survey experience, we have provided [an associated briefing note for woodland owners and managers](#). This briefing note will cover the role landowners/managers will have in the bat roost tree tag scheme and will provide extra advice to consider before habitat work is carried out and links to relevant good practice guidance.

Cost, payment and delivery

A charge for the tags and nails is necessary to ensure the scheme is self-sustaining. Postage will be covered by the buyer. Tags can be purchased through the website and multiple tags can be ordered. Cost, payment and delivery

information can be found on the [Bat Roost Tree Tag Scheme – purchasing a tag web page](#). To ensure tags are purchased by surveyors with bat survey experience i.e. a professional or voluntary bat worker we are requesting that a licence is provided where possible when placing an order. This can be uploaded when submitting a Bat Roost Tree Tag order form. If the surveyor doesn't have a licence but would like to purchase some tags, we would encourage them to email us at brtts@bats.org.uk with the number of tags they would like to order, what experience they have in bat and tree surveys and their reasons why they want the tags.

We recommend, where possible, a tree roost record is submitted first before a tag is deployed. However, we recognise that there will be circumstances where making two visits in close temporal proximity might make this impractical.

Please note, we have a limited stock of bat roost tree tags and would like to make sure that the tags are available to many rather than a few. Therefore, for now, we have limited purchases to six tags per surveyor, to avoid surveyors stockpiling the tree tags and would encourage that tags are purchased when there are confirmed tree roosts to tag.

If however, the surveyor has more than six confirmed tree roosts that they would like to tag, or there's a project that requires more tags because of a planned tree survey of a woodland, or a radiotracking survey, we would encourage the surveyor to email us at brtts@bats.org.uk with the number of tags they would like to order and the reasons why extra tags are needed. We will then consider your request and will be in contact with payment information if your request is accepted.

Databases

Information collected from the tagged confirmed tree roosts will feed into two databases - the BCT and the Bat Tree Habitat Key (BTHK) databases.

The BTHK database (<http://battreehabitatkey.co.uk>) is part of a project started by Henry Andrews to collect "identification and description of all features exploited by specific tree-roosting bat species native to the British Isles achieved by eliciting PRF records with accompanying photographic accounts" (Bat Tree Habitat Key, 2018). The BTHK database is managed by [AEcol](#).

We would urge collecting as much information as possible from Tables 1 – 3. If the required tree roost and species records are collected this means the information has a greater chance of being included in the BTHK database subject to their approval. But if time, experience, or other reasons mean only the essential information in Table 1 is submitted, this is still of vital importance as a record.

All records submitted will be kept on a BCT Access database which will be managed by BCT. If sufficient records are collected, we will share them with the BTHK project.

Using a data-share agreement we may also share the tree roost dataset with researchers to enable us to gain a better understanding of roosting bat ecology. By providing us with your records the surveyor will have agreed to this. Researchers will be permitted to use the data for academic purposes on the condition that they do not publish grid reference locations at a resolution greater than 10 km. Site names, addresses, contact and personal details will not be shared with researchers.

BCT believes it is important to provide open access to data, where it can if it does not compromise the security of sensitive sites or the privacy of the landowner. Making this data available can inform bat conservation and research work and will provide information to the public about the species occurring in their area. Landowners will need to be asked if they are happy for the records collected to be made available under public access and enhanced access with the NBN Atlas, a national database where shared data are used to support research, education, conservation and decision-making. For public access, records will be shared at either a 1 km or 10 km grid reference resolution while for enhanced access, records will be shared at either 100 m or 10 m resolution.

Please note for biodiversity data searches (BDS), a high grid reference resolution will be more useful for informing where trees may be at risk. We encourage that the 1 km resolution for public access or the 10 m resolution for enhanced access is selected. Site names/addresses and surveyor/landowner names are not shared with NBN Atlas. Landowners can choose for records not to be shared on the NBN Atlas. Further information about data sharing can be found in the [associated briefing note for woodland owners and managers](#).

Basic records

Tree roost and species information can be submitted using the Microsoft record forms on the [Bat Roost Tree Tag – Record Forms web page](#). Submitted records will go directly to BCT. Surveyors should share these records with landowners and site managers. Please note the minimum information in bold and marked with * as shown in Table 1 is required to be registered on the system.

Table 1 Information for the BCT database. Records in bold are required by BCT

Email address*	Recorder's name (surveyor or owner/manager) *
Site name *	County*
Tag number? *	Grid Reference (O.S. not lat/lon) *
Evidence of bat use (droppings, bats seen or heard) *	Type of bat survey (emergence counts, dawn counts, radiotracking, endoscope or other) *
Tree species*	Tree alive/dead*
Type of roost (maternity, day roost, hibernation roost etc.) where known	Date tree roost was identified *
Bat species (where possible)	Number of bats (if present and counted)
Roost feature type where known (see Appendix A for - Woodpecker-hole - Knothole - Pruning cut - Tear-out - Compression-fork / Double-leader - Wound - Canker - Butt-rot - Flute - Ivy - Hollows	Roost <i>features photographic guide and description</i> - Hazard-beam - Frost-crack - Subsidence crack - Shearing crack - Lightning-strike - Desiccation-fissure - Transverse-snap / snag - Weld - Lifting bark - Rot hole

Additional records

Ideally, we would like the BRTTS to contribute to the BTHK database, an ongoing study that has to date produced detailed information on how bats use trees and has identified the different roost features used by 14 UK tree roosting bats species (Bat Tree Habitat Key, 2018). The knowledge gained from the records submitted to this database has provided evidence-based support for professionals looking for tree roosts.

The additional information needed so the records collected are included in the BTHK database can be found in Table 2. Table 3 shows what optional records can be collected.

Table 2: Additional information required to be included in the Bat Tree Habitat Key database, if known

Tree Height (m)	DBH (Diameter at breast height) (cm)
Roost Feature (RF) on stem/limb	RF height (m)
Habitat (Phase 1)	DPH (Diameter at RF height) (cm)
RF has more than one entrance to the same void? Yes or No. If yes, please complete a separate form for both entrances and identify that the two forms are linked in the comments section. It is important for the BTHK database that this is carried out.	Inspection results - N: Not known to be a roost and no bats or droppings present - Pn: Known roost but no bats or droppings - Pb: Positive inspection; bats present but no droppings - Pd: Positive inspection; droppings present but no bats - Pbd: Positive inspection; bats and droppings present
Direction RF faces - North South-west - North-east South-east - North-west South - East West	

Do you have photos or videos of droppings and/or bats? (Photographic or video evidence is important and should be provided, if possible) Photographic or video evidence to be sent to BRTTS@bats.org.uk	Understorey (Sparse; Medium; Dense) Ground flora (Sparse; Medium; Dense)
	Canopy coverage (estimated %) Presence of water (within 1km) Distance from edge of woodland (m)

Table 3: Additional optional BTHK information from endoscope survey, where known. *Dependent on having a licence and being suitably experienced. It may not always be possible to supply the information below.*

Distance bat/bats were from the entrance (cm)	Bat(s) awake or torpid? - Awake - Torpid
Entrance height (cm)	Entrance width (cm)
Internal depth (cm)	Internal width and height (cm)
Apex Shape - Dome - Spire - Peak/Wedge - Flat - Chambered - Tube	Internal substrate (tick all that apply) - Smooth Dirty - Bobbly Sludgy - Bumpy Debris - Rough Dusty - Clean Polished - Waxy Blackened
Location of bat(s), if present - Above entrance - Below entrance - Opposite entrance - To the side of the entrance	Competitors present - Bird nesting - Bird night-roosting - Toad - Wood mouse - Dormouse - Woodlice - Slugs - Snails - Millipede - Centipede - Spider web with spider - Spider web with no spider visible - Grey squirrel - Red squirrel - Other
Smell - None - Pleasant - Not Unpleasant - Unpleasant	
Internal humidity (tick all that apply) - Dry - Damp - Wet	
DNA result, lab name and reference number, if droppings are analysed	

Please note if conclusive evidence of bats (i.e. droppings) is found while surveying the tree, even if it is unoccupied by bats, records should be submitted to BCT and the tree should be tagged. We are interested in records from unoccupied roost features as they are as important as the occupied roost records. If droppings are collected for DNA analysis, please provide the results, when submitting the records to BCT.

We know the records collected will depend on the surveyor's experience and availability. We recognise that there will be circumstances when the surveyor will have a limited time to survey a tree roost. To reiterate:

- Table 1 shows the records we would like the surveyor to collect for the BCT database (with essential information marked * and in bold).
- Table 2 shows the additional information required to be included in the BTHK database.
- Table 3 shows further optional additional BTHK data which can be collected where possible.

Photographic or video evidence

Where possible, please send photographic or video evidence with each record form submitted showing either droppings and/or bats. Any video footage of resident bat/s (infrared, thermal, trial camera or endoscope footage), would be acceptable. Do also provide photographs of the tree and the roost feature where possible. *Please note to use an endoscope, you will need to have a Level 2 class licence, which allows the use of an endoscope for surveying bats or be an accredited agent on someone's licence.* If you don't have a licence to use an endoscope, only take photographs or videos of droppings or bats if they are visible (i.e. droppings on the tree bark).

Please send all photographic/video evidence to brtts@bats.org.uk, together with the tree tag number. Providing the tag number is important so we can match the records with the photographs/videos. Ideally send your photographs and video footage, if you have any, straight after submitting your records. Photographs and videos will be stored securely in a folder on the BCT server and will be shared with BTHK when necessary.

We understand it may not be possible to collect all BTHK's required records or provide photographic/video evidence. At a minimum, please try to collect the records highlighted in **bold** in Table 1. This can include visual counts and information from bats tracked to their roost during radiotracking studies.

Long term monitoring of tree roosts

Tree roost features can be transient and can also be fragile. Currently, very little long-term monitoring is carried out on trees once they have been confirmed as a bat roost. It will improve our understanding of the use of tree roosts by British bats and contribute to the conservation of bats if confirmed tree roosts are re-surveyed as part of a long-term monitoring scheme. We are currently looking into the possibility of a long-term monitoring scheme, with a focus on maternity colonies. We are aware of the ask this places on those surveying the roosts and will therefore be seeking feedback from surveyors, following the submission of maternity roost records, on whether they would be interested in taking part in any long-term monitoring of their tree roosts. Even if only a small subset of tree roosts are monitored, over time this could prove hugely important.

Condition of the tag

Tree tags have been fixed to trees over the years, but there is very little information available to tell us exactly how long they last. We are using anodised aluminium which has a long service life, and we are supplying thicker tags (1.2 mm thickness), so they will not easily buckle or be engulfed in the tree. We encourage surveyors to be responsible for the ongoing care of the tree tag and check the tag condition every few years if in the area. Please do consider replacing the tag and purchasing another tag, if you find it has eroded, fallen off or is engulfed by the tree. This will allow us to update our records and also ensure that the tree roost continues to be protected.

On the public forest estate, the condition of the tree tag is likely to be checked every 5-10 years as part of ongoing operations. On private land, we recommend a similar procedure should be followed.

A tag condition feedback form can be downloaded from [here](#). Any feedback where possible, from the surveyor or landowner/site manager, is appreciated as this will inform us on how long the tags are lasting.

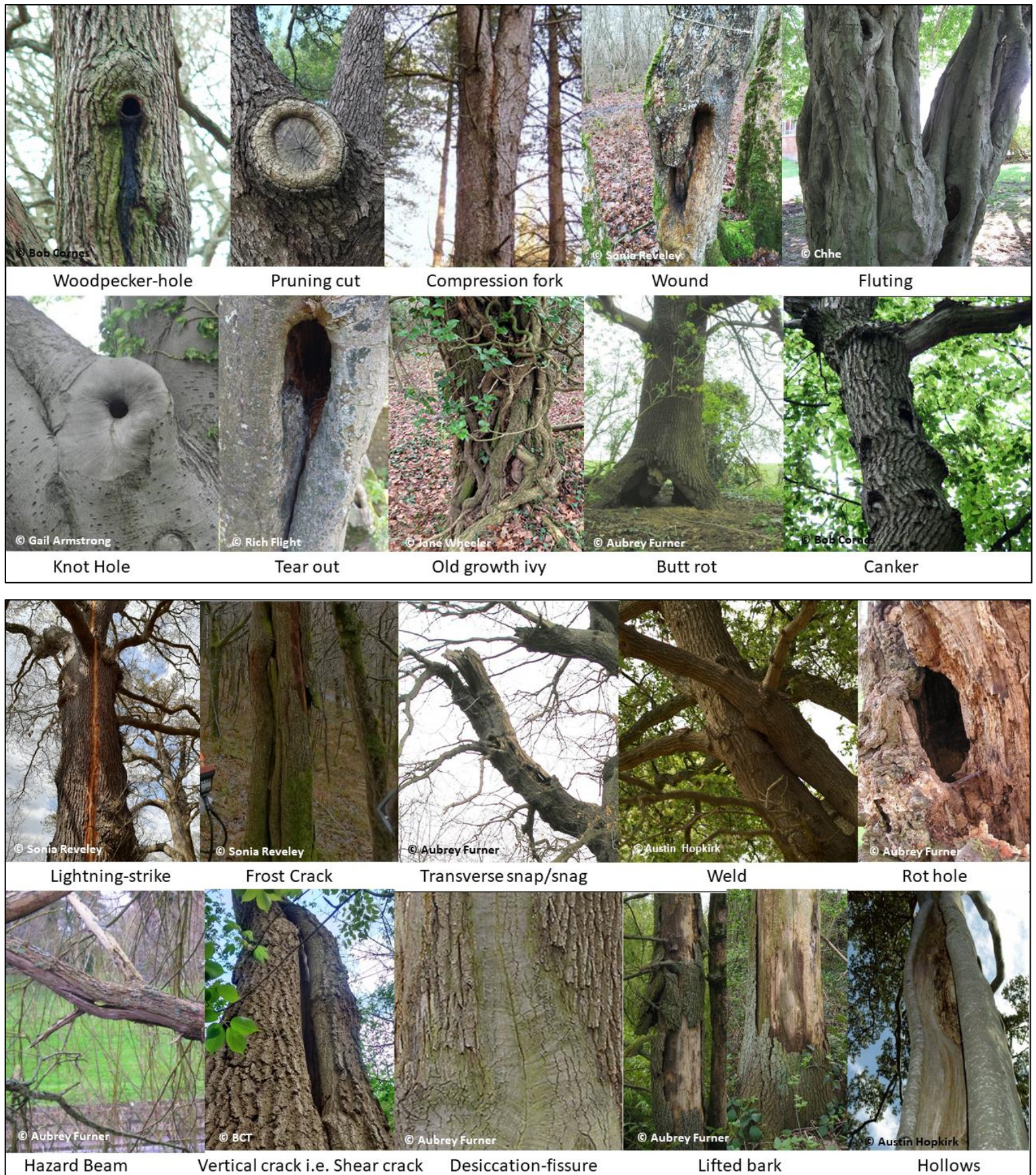
Reusing the tag

Some tree roosts are fragile and therefore transient. When revisiting a tree roost a few years later, you discover the tree roost no longer exists but the tag is still intact, do consider reusing the tag on another confirmed tree roost and submitting the new records to BCT.

References

BTHK 2018. Bat Roosts in Trees – A guide to identification and assessment for tree-care and ecology professionals. Pelagic Publishing, Exeter

Appendix A- Roost feature type and description



Roost Feature Descriptions

Woodpecker hole – a hole created by woodpeckers. If the hole extends upwards, then this feature has great potential.

Knot-hole – when a branch falls off, the tree seals off what remains of the limb. If rot settles in then over time this leads to the formation of a cavity, which may have roost potential.

Pruning-cut – the removal of a limb up to the branch collar with hand or power tools. To reduce decay, the tree compartmentalises the limb but if rot settles, small crevices and holes can form. Where the bark heals, new growth turns into the heartwood. Known as ram's horns they provide gaps for bats.

Tear-out – when a limb is forcibly torn away from the main stem, leaving a characteristic hole and long fissure that has an upside-down tear-drop shape. Roosting opportunities exist within the rotted cavity and in crevices along the callus wood.

Compression-fork / Double-leader – when the main apical bud on a coniferous tree is damaged, the tree grows two apical buds. This then develops into two trunks and stresses over time will pull the stems apart to form a vertical cavity between the two limbs. Double leaders will also form on some broadleaf trees like beech and cherry when two parallel trunks develop by dividing.

Wound - when the bark and cambium are damaged by an abrasion created by a fallen limb, vehicle strike, deer damage or bark stripping from squirrels. Rot then settles into the abrasion, causing heartwood decay, creating deep cavities.

Canker-a bacterial infection of the tree, causing blistering of the bark. Has an oval or elongated shape.

Butt-rot – a disease caused by fungi. The fungi attack the butt above the root, where the stem meets the soil. Root rot will then travel up the tree interior creating a conical column of dead rotting matter which can go up quite a fair distance up the tree.

Flute – where a longitudinal groove forms naturally in the trunk of the tree or in between the buttresses of the tree.

Ivy - Old-growth ivy may provide suitable cavities for roosting. Ivy itself only forms a roost location when they have large overlapping limbs (greater than 50 mm diameter).

Hazard-beam – normally a branch that has been twisted by the wind. Internal stresses create longitudinal splitting and cavities that spreads along the whole limb, normally widest in the middle.

Frost-crack – a vertical crack associated with extreme cold weather when freezing and thawing occurs. The bark shrinks in freezing conditions and expands on warm days. Ash and maple trees are prone to frost cracks. Normally found on the main stem and over time will form a deep vertical callus ridge.

Subsidence / Shearing crack – cracks that form due to stress from high winds or weight from another limb. Subsidence cracks form when the weight from another limb bears down on a bent limb creating a split. Shearing cracks are caused by wind and can run into the centre of the main stem and occasionally can separate into two distinct halves.

Lightning-strike – when lightning hits a tree, the sap expands and vaporises, causing part of the tree to explode. This leads to scarring and cracking along the main stem and can over time provide huge cavities, and plenty of crevices. One of the more difficult roost feature to check due to the multiple opportunities it provides for bats along the entire tree.

Desiccation-fissure – narrow vertical fissures formed when the heartwood shrinks. Normally surrounded by an area of exposed heartwood.

Transverse-snap / snag – damage caused by wind, leading to a large split on the stem or a rough, ragged branch stub, protruding out from the bark collar with plenty of crevices and cracks.

Weld - a gap between overlapping stems or branches. Can often seal up completely, but where access is maintained, a round cavity on the inside develops that is suitable for bats.

Lifting-bark – loose plate or slabs of bark, produced when a limb or tree dies. The bark then dies back, and the heartwood dries and contracts.

Rot hole – a hole where rot has settled and the inner wood has started to decay, leaving a mass of dead rotting matter.

Hollows – when a tree has a rotten core, and the main trunk has hollowed out.

Further details about the above roost features can be found in the Bat Roosts in Trees book – A guide to identification and assessment for tree-care and ecology professionals by the Bat Tree Habitat Key.