

Woodland Management in the presence of bat species: Guidance for compliance with the Habitats Regulations¹

BATS

¹ The 'Habitats Regulations' refers to The Conservation of Habitats and Species Regulations 2010

Purpose of document

To provide advice for woodland managers and operators on a) how to establish presence of bats particularly their breeding sites or resting places, and b) how to manage woodlands so as to avoid or minimise the risk of committing offences under the Habitats Regulations. All bat species are protected by the Habitats Regulations and are European Protected Species (EPS). Information on long-term habitat management to benefit these species is also provided.

This guidance should be used alongside the Decision tree to aid planning of woodland operations and protecting EPS.

1. Look at your woodland. What is the probability of bats being present in your woodland or habitat type?
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Is your woodland suited to supporting bats particularly their breeding sites or resting places i.e. bat roosts?

Bats will roost in trees that have a space or cavity providing shelter from the elements.

- Trees less than 80 years old are least likely to contain roosts but may do so if they have woodpecker holes, rot holes, crack splits or loose bark.
- Trees more than 80 years old have a reasonable chance of containing roosts.
- Trees more than 120 years old have a high chance of containing bat roosts because they offer so many possible roost sites.
- Unthinned, upland conifer plantations, recent plantations with stem diameter less than 20cm are poor indicators for bat roosts.
(Forestry Commission Publications (2005) Woodland management for Bats)

Bats use woodland for foraging and may use woods some distance from their roost site.

Table 1 provides a summary of woodland type, location and the bat species that are likely to be using the habitat in Wales.

More detail on all British bat species can be found in Table 3.

Table 1. Woodland type and use by bat species recorded in Wales – starting with the least likelihood of use by bats

Woodland type and location	Bat Species (see table 2)	Bat Activity	Additional factors that increase likelihood
Conifer – upland and lowland	Most likely Group 4a, 3 Group 3 Groups 3 and 1b) if within range	Foraging, commuting. Roosting (if tree holes, splits, bat boxes present) Swarming at underground sites Roosting in mines/ caves	Woodland connected to other habitat by hedgerows, scrub, water courses. Presence of underground sites important for Groups 1b and 3. Presence of buildings or other structures (e.g. bridges) for day roosts or night roosts.
Mixed woodland	Most likely Groups 4a), 3. Also Groups 1 and 4b) if within range Group 2 if suitable roost trees	Foraging, commuting. Roosting (if tree holes, splits, bat boxes present) Swarming at underground sites Roosting in mines/ caves Roosting (large ash, beech, oak, also Scots pine at woodland edge)	Presence of woodland rides, sheltered unlit woodland edges. Presence of water courses, esp. slow flowing and sheltered, or ditches, ponds, lakes.
Deciduous woodland	Groups 4, 3, 2. Group 1 if within range	Foraging, commuting. Roosting (if tree holes, splits, bat boxes present)	
Deciduous with high proportion of oak & dead wood	Groups 4, 3, 2. Group 1 if within range	Foraging, commuting. Roosting (if tree holes, splits, bat boxes present)	

Further information on location and habitat requirements of these species is available from the Bat Conservation Trust (www.bats.org.uk).

2. Are they known or likely to be present in or near (within 2km) of this particular wood?

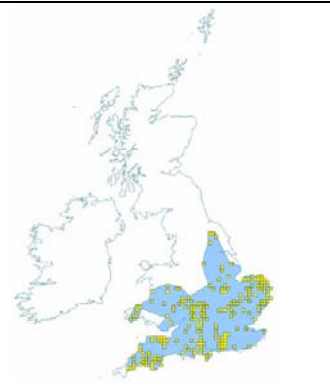

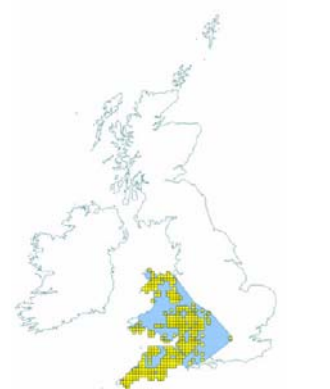
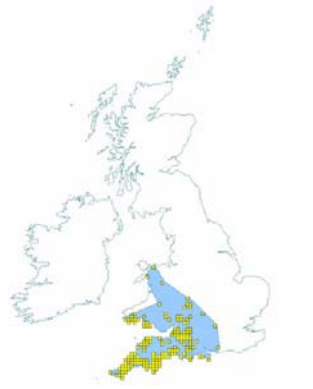
Bats may be found in any woodland in Wales. The most commonly found bat species (Common and Soprano pipistrelles – Group 4, below) are the least reliant on woodland and although their presence needs to be considered, it is unlikely to have a major impact on management.

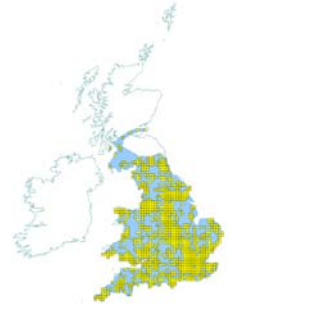
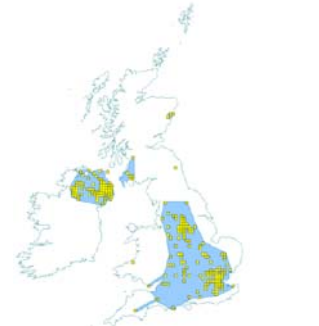
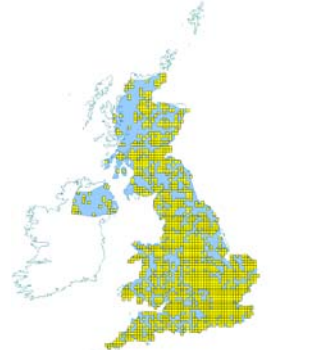
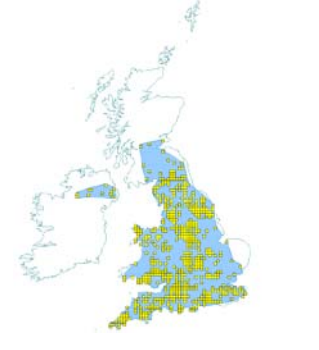
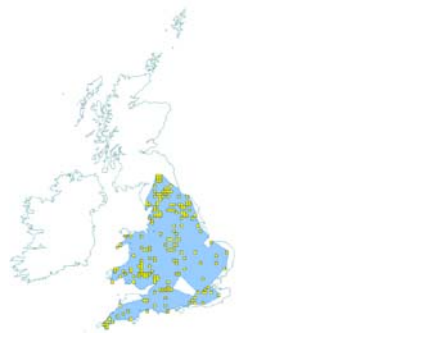
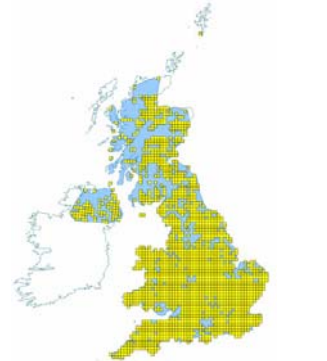
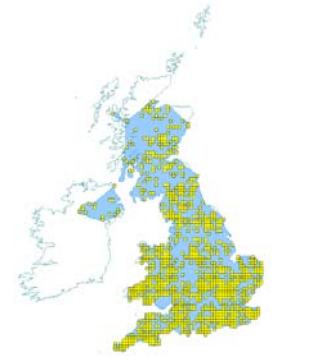
The rarest species need special consideration (Group 1), as the habitat they use may be protected by SSSI and SAC. Even if your wood is not a designated site, it is necessary to consider whether any management could have an impact on the nearby population. They are also dependent on woodland, either for roosting, or for foraging and commuting.

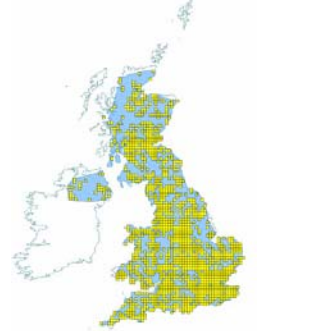
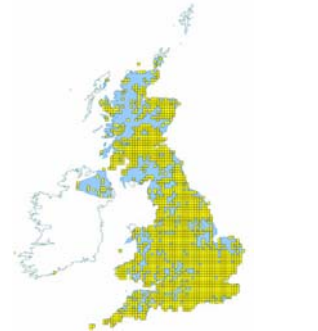
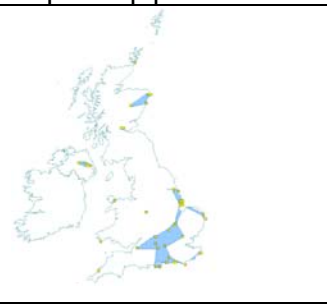
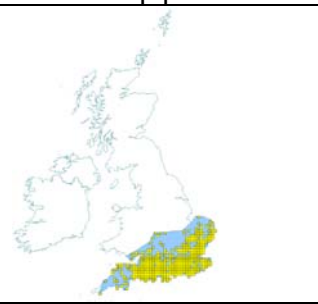
The other bat species (Groups 2 and 3) lie in between these two extremes – many are widespread and can be found in most areas of Wales, all use woodlands to some extent, but use other roost sites and habitats as well.

The maps below show the approximate distribution of the different bat species in Wales. Yellow squares show records to 2006, the blue areas shows the expected current range.

Table 2. Distribution of bat species in Wales*.

<p>Group 1. Very rare bats. All four are Annex II Species – their breeding and hibernation sites and foraging habitat may be notified as SSSI and/or SAC.</p>		
		<p>1a) Reliant on trees as roost sites. Very rare. Most likely to be found in old growth, ancient semi-natural woodlands. The Barbastelle is a wide-ranging bat and probably occurs further north in Wales than has been recorded so far. It is not yet clear if Bechstein's breeds in Wales.</p>
Barbastelle bat	Bechstein's	
		<p>1b) Reliant on woodland for commuting and foraging. Do not roost in trees. Only 5 breeding sites are known for Greater horseshoes, all in south Wales, but small numbers may be found elsewhere. Lesser horseshoes occur through most of Wales. Both species breed in buildings, often in wooded river valleys and</p>

Lesser horseshoe bat	Greater horseshoe bat	forage in woodland or sheltered pastures. They travel to underground hibernation sites that may be in exposed upland areas following hedgerows or streams.
Group 2. Species totally dependent on trees as roost sites		
		<p>Only roosts in trees in Wales. The Noctule is found throughout Wales. Records of Leisler's are few.</p> <p>Large breeding colonies of noctules (exceptionally 100+) can be found in a single tree hole. Smaller numbers congregate in tree holes to hibernate.</p>
Noctule	Leisler's bat	
Group 3. Widespread species that roost in trees, but also in buildings and underground		
		
Daubenton's bat	Whiskered bat	Brandt's bat
		<p>More common species that have adapted to built structures, but roost in trees throughout the year. Woodlands are also used for foraging and commuting.</p> <p>Many tree roosting bats move roost site frequently, often only staying 2 – 3 days before moving to another tree roost.</p>
Brown long-eared bat	Natterer's bat	
Group 4. Species least dependent on trees		

		4a) Common and Soprano pipistrelles may be found anywhere in Wales. Breeding females gather in roofs of buildings in the summer to give birth. Males and non-breeding females use trees as any time of year. Buildings used as roosts are often close to woodland, which is used for commuting and foraging.
Soprano pipistrelle	Common pipistrelle	
		4b) Nathusius' pipistrelle and Serotine are very rare in Wales. No breeding sites have been recorded for Nathusius yet and only one or two for Serotine. Both species are reliant mainly on buildings, but will use trees as roosts and woodland for commuting and foraging.
Nathusius' pipistrelle	Serotine	

* Current extent of occurrence and occupied 10-km squares (1990-2006)
Source Joint Nature Conservation Committee. 2007. Second Report by the UK under Article 17 on the implementation of the Habitats Directive from January 2001 to December 2006. Peterborough: JNCC. Available from: www.jncc.gov.uk/article17

b. Consult the National Biodiversity Network.

The National Biodiversity Network Atlas(NBN) Wales is available on the web.
<https://wales.nbnatlas.org/>

Search for records of bats near or in your woods by using the species search and interactive maps to zoom to your area of interest. Please note that not all recent occurrences of bats may be shown on the map. A lack of records does not necessarily confirm absence of these species. Local Records Centres and local bat groups may hold additional species records. Your local Countryside Council for Wales or County Wildlife Trust representative, is also likely to be able to give site specific information on likelihood of bat presence, as may the Local Biological Records Centres www.lrcwales.org.uk Natural History Societies and local Bat Groups <http://www.bats.org.uk/> or Mammal Groups - contact details from: <http://www.mammal.org.uk/>

3. Would the proposed operations or activities have an impact on bats if present?

Woodland management is most likely to impact on bats by damaging or destroying bats roost in trees. Although bats use most woodland habitat for foraging it is unlikely that woodland management would deliberately disturb the bats during foraging unless extensive and sudden loss of foraging or commuting habitat around roost sites resulted.

If bats are, or are likely to be, present will your planned operation impact in any of the following ways?

- i. Kill or injure a bat.
- ii. Cause disturbance to bats that is likely to impair their ability to survive, breed, reproduce or hibernate; or affect significantly their local distribution or abundance.
- iii. Damage or destroy a bat resting-place or breeding site.

Table 4 lists forest operations and the risk of committing an offence associated with each operation.

4. How to avoid or reduce the impact on bats whilst carrying out woodland operations

The following types of operations could result in an offence being committed if bats are present:

- Harvesting, including felling or thinning of stands
- Tending and establishment
- Road construction and maintenance
- Forest Stewardship (notably tree safety)

Table 4 provides further information on how you may alter these operations to reduce the risk of committing an offence and the need for a licence. The aim should be, during operations, to avoid damaging or destroying a roost or carrying out activities that disturb bats in their roosts. If the operation you are planning does not have a satisfactory, low-risk alternative as indicated within Table 4 then you may decide to apply for a licence.

5. If bats are present and impacts cannot be avoided is survey information available?

Recent survey information will confirm presence and numbers to provide information on any impact.

If you suspect that bats are present in your woodland and you intend to carry out management you will need to assess the risk that you may commit an offence.

The organisations listed in **section 2** are most likely to know of recent surveys. If surveys are available go to **section 8**, if not then move to **section 6**.

6a. Can the landowner/manager do an initial survey of the site?

If you suspect that bat roosts are present in your woodland and you intend to carry out management you will need to assess the risk that you may commit an offence (e.g. damage or destruction of a roost or extensive sudden loss of foraging or commuting habitat).

Assessing presence of bats by looking for signs or indicators

➤ Sightings

Bats are mainly active between March and November and hibernate during the winter months, however they can be active at any time of year in mild weather. They emerge around sunset and usually forage all night until dawn. Different species display different flight patterns. E.g. Noctule bats have a characteristic powerful,

direct flight, they fly in the open, often well above tree-top level, with repeated steep dives. Pipistrelle, Whiskered and Brandt's bats often fly along rides or woodland edge and can be seen patrolling a beat just after dusk. Other bat species are unlikely to be seen as they emerge after dusk, though they may be heard up on bat detector. It is possible to see them returning to the roost at dawn.

➤ Signs of bat roosts in trees

Bats use trees as resting places throughout the year. Trees may serve as maternity roosts, mating roosts, hibernation roosts and/or temporary/transitory roosts. Mature trees, particularly oak, ash, beech, sycamore and Scots pine, are most frequently used as roosts, but bats will use any tree with suitable cavities or crevices.

The most effective time to look for potential bat roosts is during winter when the trunk and crown are visible without leaves being present. Use binoculars during good daylight to look for:

- Obvious holes, cavities, splits and loose bark (old woodpecker holes are particularly favoured)
- Dark staining and streaks on the tree below the hole (although this is often due to water seepage)
- Staining around the hole from oils in bat's fur particularly in autumn
- A maze of tiny scratch marks from the bat's claws around the hole, often around top edge. These are often only visible close up.

During the summer it may be possible to notice:

- Droppings below the hole – these have the appearance of rodent's droppings but crumble to a powder of insect fragments
- Noise of squeaking/chittering coming from hole, especially on a hot day in high summer or just before dusk as bats are getting ready to emerge.
- Strong smell of ammonia or flies close to a hole

For more information on surveying for bats see the good practice guide Woodland Management for Bats (Forestry Commission Publications, 2005) www.forestry.gov.uk/forestry/INFD-6K3CXY or contact the Bat Conservation Trust (www.bats.org.uk) [Professional Guidance and good practice - Bat Conservation Trust](#)

To reduce the risk of committing an offence look for evidence of bats and if they are found adjust management plans in the light of the guidance given in here.

6b. Specialist Survey required to identify and locate any breeding sites or resting places.
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Determining the location of roosts will be important when planning operations so they remain lawful (see table 4). Difficulty in detecting roosts may suggest that commissioning a specialist survey may be a sensible step. Alternatively, consider engaging local specialists, for example, a local bat group may be interested in carrying out a bat walk in your woodlands and this could provide information on bat presence.

7. Landowner/manager undertakes survey and evaluates results.
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If by self-assessment and survey (using the information above) or by specialist survey you are confident that proposed woodland operations will not result in roost loss or damage, then no further action is necessary and the operation may proceed.

It would be sensible to keep a record of your decision and information used to reach it, (for example a specialist survey). If however bats or fresh signs of bats are discovered during operations (especially from likely roosts), you should immediately stop work, and seek advice from the Statutory Nature Conservation Organisation (SNCO) and review your plans as required. It is therefore important for operators to remain vigilant for bats and other EPS while undertaking work.

8. Can the work be undertaken, or proposals modified to avoid an offence being committed?

Once obvious roost(s) have been identified through survey (N.B. recording of roost site areas on felling or design plans is recommended), where possible, plan woodland management to avoid the roosts or area of woodland supporting the roosts.

9. Can you provide evidence to support a licence application that satisfies the criteria in section 9 of the decision tree?

If avoidance of damage or destruction to a bat roost is not possible a licence will be required before the operation can be undertaken. The licence application will require details about the bat roost(s) and evidence that there is no satisfactory alternative to committing the offences in question i.e., damaging or destroying bat roosts even when bats are not present. Licences are to be granted for specific purposes e.g. public safety and are subject to strict tests. There is no guarantee that a licence will be granted and speculative license applications will not be considered.

Consider potential for long term provision of habitat for bats

Consider the potential for maintaining populations by planning regular but sensitive active management to provide a continuity of habitat over time that will ensure that populations are maintained in a favourable conservation status. Woodland habitats can be improved for bats by increasing roosting opportunities, improving foraging areas and increasing the number of insects available.

The habitat for bats can be improved by:

- Increasing structural and species diversity of the woodland understorey and its density. Development of the understorey is promoted by increasing the light levels reaching the woodland floor, by coppicing, thinning and gap creation together with control of browsing and grazing. Fencing to exclude grazing animals may in addition be required in some areas to maintain diverse species-rich ground flora and shrub layers. A network of ride, rack and glade creation and maintenance will also be beneficial providing foraging habitat and corridors for bat movements between favoured foraging and roosting sites.
- Providing new areas of woodland and increasing the continuity of woodland cover and in providing connectivity in broader landscape context. Establishing new areas of woodland, particularly native broadleaf linkages to favoured foraging sites such as riparian zones, and to linear features such as old hedgerows will enable bat movement through landscapes. In the lowlands, buffer strips alongside farm woodlands and in the uplands planting native broadleaf mixtures and shrubs along the edges of conifer plantations, will help improve the edge habitat and promote a higher diversity of insect species.
- Creation of non-intervention strips along watercourses (within woodlands) and buffer zones, broad-leaved corridors will benefit brown long-eared bat, noctule, and barbastelle. Open spaces and water will benefit whiskered, brown long eared and Daubenton's. Wetland habitats are important to all species in spring and autumn.
- Provide roost sites by retaining old trees with old woodpecker holes, dead, damaged, and sustainable dying trees, especially those close to trees already used for roosting. Provide a continuity of roost sites by allowing a broad age structure to develop and diversify woodlands (oak, ash, beech, sycamore and Scots pine are preferentially used, but any tree with cavities and crevices is valuable). Leave 7-10 old trees with roost features per hectare and the same number of younger trees to become the next roost tree generation. Some bat species will readily use suitable bat boxes however these should not be seen as a permanent solution to the shortcomings in availability of suitable tree roosts.
- Use continuous cover forestry practices in preference to clearfelling, especially for broadleaved woodlands and set aside areas of woodland supporting the roosts as a Natural Reserve with minimum intervention.
- Protect roosting sites by leaving a buffer around the trees harbouring these sites and by providing connections to other optimal roost site habitat.

Additional Notes

1. All bats have some level of association with woodland, ranging from foraging at night for insect prey to the use of trees for roosting, hibernation and breeding (breeding sites or resting places) at various times of the year. Woodland use is related to the particular species' need, the type, and size of woodland. All species are insectivorous, foraging in or over woodland, woodland edges and glades, often where there is a diverse understorey structure. Some species (Barbastelle and Bechstein's) are restricted to foraging in woodlands but the majority of bat species use a range of habitats e.g. some species catch their prey over or near water. Larger woods are likely to provide both roost and foraging sites for all the bat species (where habitat and species range allows).

2. Routine forestry / woodland management activities can potentially result in offences being committed if bats or their breeding sites or resting places are present and it is vital that managers review planned activities to identify such risks. The offences that may be committed under Regulation 39 are listed in Annex A in the Part 1 guidance.

Good practice reference list

Anon (2005) Woodland Management for Bats. Forestry Commission England, Forestry Commission Wales, Bat Conservation Trust, Countryside Council for Wales and English Nature www.forestry.gov.uk/forestry/INFD-6K3CXY or http://www.bats.org.uk/pages/professional_guidance.html
Free copies also available from Forestry Commission Publications Tel: 0870 121 4180.

Arboricultural Association Guidance Note 1 – Trees and Bats

Bat Conservation Trust species leaflets http://www.bats.org.uk/pages/about_bats.html

Bats and Trees (in prep), Specialist Support Series, Bat Conservation Trust
http://www.bats.org.uk/pages/professional_guidance.html

Bat Survey Guidelines (2007) Bat Conservation Trust.

http://www.bats.org.uk/pages/professional_guidance.html English Nature Research Report 658 *Woodland Management Advice for Bechstein's bat and barbastelle bat*. See: English Nature publications
www.englishnature.org.uk/pubs/publication/pub_search.asp

Eds: Harris, S. & Yalden, D.W. (2008) *The handbook of British mammals*; 4th Edition. The Mammal Society, Southampton

Produced by Forest Research, Forestry Commission Wales and CFS, Welsh Assembly Government and Countryside Council for Wales.

Table 3. Bat habitat use (Adapted from: Mitchell-Jones, A.J. (2004) Bat Mitigation Guidelines (Table 4.1), English Nature, Peterborough)

Bat species	Woodland habitat used	Roost sites (S=Summer) (W=Winter)			Other habitats used for foraging	Foraging distance (if known)
		Trees	Buildings	Under-ground		
Barbastelle	Deciduous, uneven aged, or ancient semi-natural with high proportion of oak trees, dead wood, and with a dense mixed under storey	H	M (S) L (W)	N (S) H (W)	parkland, water, water meadows, wet woodland, minor rural roads	20 km
Bechstein's	Oak woodland with streams and understorey. Occasionally mixed broadleaf	H	L	L (S) M (W)	none	1-2 km
Noctule	Deciduous woodland	H	M (S) L (W)	N	parkland, pasture, water and forest edges, heathland	15 km
Brown long-eared	All types of woodland, parkland and gardens	H	H	N (S) M (W)	parkland, orchards, hedges	5 km
Grey long-eared	All types of woodland, parkland and gardens	L	H (S) L (W)	N (S) M (W)	parkland, orchards, hedges	5 km
Leisler's	Open deciduous, mixed and coniferous woodland,	M	H (S) L (W)	N	parkland, suburban areas and around street lamps, wetland habitats	
Natterer's	Open Deciduous woodland, mixed and conifer woodland e.g. Scots and Corsican pine plantations	M?	H (S) L (W)	L (S) H (W)	Pasture, parkland, hedgerows, along water-side vegetation	
Lesser horseshoe	Deciduous woodland and conifer woodlands	L	H (S) M (W)	L (S) H (W)	scrub, parkland, wetland and permanent pasture	2-3 km
Brandt's	deciduous and possibly mixed and conifer woodland	L	H	N (S) H (W)	Woodland edges, rides and dense cover, often near water	
Whiskered	deciduous and possibly mixed and conifer woodland	M?	H (S) L (W)	N (S) H (W)	Woodland edges, rides and dense cover, often near water	
Pipistrelles	open deciduous, mixed and conifer woodland,	M	H	N (S) L (W)	woodland edge, over water, marshes, farmland, along hedgerows, suburban gardens and urban areas	4 km
Daubenton's	Deciduous woodland	M?(S) L?(W)	M (S) L (W)	M?(S) H (W)	over lakes, rivers and ponds, but also forages in woodland	13 km
Serotine	Open deciduous, mixed and conifer woodland,	N	H (S) N (W)	N (S) L (W)	woodland edge., pasture, parkland, tall hedgerows, gardens, suburban area	
Greater horseshoe	Deciduous woodland	N	H (S) L (W)	M (S) H (W)	scrub, permanent pasture, water, along hedgerows	15 km

Trees – includes all types of crevice and hollow as well as bat-boxes attached to trees
Buildings – above ground areas, with an emphasis on roof voids and other areas warmed by the sun
Underground – anywhere that provides cool humid conditions buffered against rapid temperature change
Includes caves, mines, tunnels, fortifications, cellars, icehouses, limekilns etc.

N – not recorded in recent times
L – low dependence; unusual, but has been recorded
M – some usage recorded, though perhaps not the most important type of site
H – the most frequently recorded type of site for this species/activity

Table 4. Forest operations, risk of committing an offence associated with each operation and procedure for reducing risk.

Forest operations are in **bold** type, descriptions in plain type; low risk alternatives are proposed where possible and the approach to managing risk is suggested.

Risk of committing an offence	Operations that are likely to damage or destroy roosting sites of bats (high risk).	Alternative approaches to high risk operations that may reduce risk	Managing risk: Options for low risk approach	
Operation	Sub-operations (and brief description of impact)		Safest	Some risk
HARVESTING, INCLUDING FELLING OR THINNING OF STANDS	Harvesting of trees containing roosts will damage or destroy bat roost or cause obstruction to roost entrance of mine / cave dwelling or swarming bats.	<ol style="list-style-type: none"> 1. Avoid felling trees that contain roosts. 2. Leave trees immediately around those with roosts and trees containing potential roost sites. 3. Identify location of underground roost sites and do not allow harvesting debris to block cave exits etc 4. Avoid felling close to roost sites; maintain a 20m disturbance- free buffer. 	Carry out alternative approaches 1+2+4 or 3+4	1 or 3
FOREST MANAGEMENT	Dangerous tree management / roadside or pathside tree works. Felling or removing limbs from a tree containing roosts will cause damage or disturbance to the roost.	<ol style="list-style-type: none"> 1. Consider altering route of footpath. 2. Consider a Crown reduction Or Removal of limb, rather than felling whole roost tree. 3.If no alternative, follow best practice for tree works to bat roosts(ref SNCO guidance*) and avoid work during hibernation or breeding period where not emergency. 	1	2 Or 3
ROAD CONSTRUCTION AND MAINTENANCE	Felling new road lines could damage or destroy bat roosts or cause obstruction to roost entrance of mine / cave dwelling bats.	<ol style="list-style-type: none"> 1. Change the route of the new road to avoid roost 2. Leave trees immediately around those with roosts and trees containing potential roost sites. 3. Identify location of underground roost sites and do not allow harvesting debris or road material to block cave exits etc 4. Avoid felling close to roost sites; maintain a 20m disturbance- free buffer. 	1 or 2+4 or 3+4	3

*Reference Statutory Nature Conservation Organisation bats in trees guidance note