

# Bats in Buildings

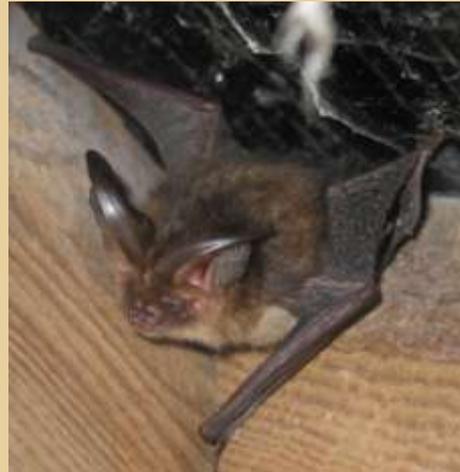
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*Guidance Notes for:*

*Planners, engineers, architects and developers*

*1<sup>st</sup> Published in December 2010, Updated in September 2014*

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BAT CONSERVATION  
IRELAND

## Bat in Buildings

Bats have adapted to living in our buildings and, for some species, this means that their survival is dependent on such roosting sites being available from year to year and after renovation of buildings. Typical buildings vary greatly from churches to Georgian mansions, agricultural stone buildings, courtyards, modern buildings and flat roof extensions. Like swallows, bats are usually seasonal visitors and are typically present for 4-5 months of the year. Female bats generally form maternity colonies in May, give birth to a single baby in June and start to leave the colony in August when the young bat is adult size and able to fly. This seasonal pattern does vary somewhat for each species of bat but this generally applies.

Bats have adapted to roosting in our buildings to take advantage of a warm, secure location to give birth and raise their young. Potential roosting sites in buildings include walls, eaves and roof spaces. To maximise warmth, which is essential for the maternity colony, roosts are often located on the south and west of the house or around other heat sources such as chimneys and boilers. Most species prefer to roost in small spaces so are not necessarily visible and householders may not realise that they are present. They tend not to be found in open draughty areas.

**It is essential to determine whether bats are present in an existing building. By taking them into consideration prior to starting works you will minimise any cost and delays to planned works.**

### Important roosting sites in buildings

- Crevices in stone work of old and modern structures
- Crevices in brick work of chimneys
- Attics of buildings – old and modern buildings – often behind roofing felt, under ridge tiles or in wall cavities
- Underground structures associated with older buildings



Daubenton's bat foraging over water (© Frank Greenaway)

Daubenton's bat (illustrated in the photograph above), a member of the *Myotis* family group, commutes and forages along dark wildlife corridors such as rivers and consequently shies away from highly illuminated sections. Bats are mammals and Irish bats feed exclusively on insects. Each bat species will feed on different types of insects. The Daubenton's bat feeds on aquatic insects such as midges, mayflies and caddis flies. The brown long-eared bat, which prefers to hunt in woodland, feeds on moths and beetles.

## Recognising potential roosting sites for bats

It is often difficult to tell if a structure is used as a bat roost because these small mammals can tuck themselves away out of sight. Therefore, it is important to be vigilant for suitable roosting sites and for more obvious signs of occupation such as bat droppings.

Irish bats are very small and a crevice greater than 50mm deep and 12mm wide can be used as a bat roost or allow the bat to access a larger chamber within the structure behind the crevice.



This 3D shape is 12mm high/wide and 50mm long, illustrating the dimensions of a suitable crevice for a single bat to use as a roost or access a roost.

Other evidence to be aware of includes grease stains around access holes. As bats squeeze themselves through crevices oil from their fur can leave dark polished surfaces indicating bat usage. In addition, the lack of cobwebs around a crevice can also indicate that it is used by bats.



Crevices should be checked by using a high powered narrow beam torch light or an endoscope. A single soprano pipistrelle was found in this crevice.

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## Ireland's bat fauna

Ireland's bat fauna is comprised of nine resident species, forming one third of Ireland's land mammals. Eight species are vesper bats and all vespertilionid bats have a tragus (cartilaginous structure found inside the pinna of the ear). Vesper bats are distributed throughout the country. Nathusius' pipistrelle is a recent addition to the Irish list while the Brandt's bat is a potential tenth species.

Common pipistrelle *Pipistrellus pipistrellus*

Soprano pipistrelle *Pipistrellus pygmaeus*

Nathusius' pipistrelle *Pipistrellus nathusii*

Leisler's bat *Nyctalus leisleri*

Brown long-eared bat *Plecotus auritus*

Natterer's bat *Myotis nattereri*

Whiskered bat *Myotis mystacinus*

Brandt's bat *Myotis brandtii*

Daubenton's bat *Myotis daubentonii*

The ninth resident species, the lesser horseshoe bat *Rhinolophus hipposideros*, belongs to the Rhinolophidea and has a complex nose leaf structure. This species' current distribution is confined to the western counties of: Mayo, Galway, Clare, Limerick, Kerry and Cork.

Bats are widely distributed throughout a range of habitats in the Irish landscape. Due to their reliance on insect populations, specialist feeding behaviour and habitat requirements, they are considered to be valuable environmental indicators of the state and condition of the wider countryside.

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Above: Natterer's bat (Photo: Tina Aughney).

Below: Brown long-eared bat (Photo: Faith Wilson).



## Bats and the Law

Due to increasing pressure on bat populations, all Irish bat species are protected by the 1976 Wildlife Act and 2000 Amendment. They are also protected under the EU Habitats Directive.

Consequently, it is a criminal offence to

- Intentionally kill, injure or take a bat
- Possess or control any live specimen or anything derived from a bat
- Wilfully interfere with any structure or place used for breeding or resting by a bat
- Wilfully interfere with a bat while it is occupying a structure or place which it uses for that purpose

This is a brief summary of the main points of the law. Further details of the Wildlife Act and the Habitats Directive may be found on [www.npws.ie](http://www.npws.ie).

More information about bats and their conservation can be sourced from the following documents:

McAney, K. (2006) A conservation plan for Irish Vesper bats. *Irish Wildlife Manuals* No. 25. National Parks & Wildlife Service, DoEHLG. [www.npws.ie/en/PublicationLiterature/IrishWildlifeManuals](http://www.npws.ie/en/PublicationLiterature/IrishWildlifeManuals)

Kelleher, C. & Marnell, F (2006) Bat mitigation guidelines for Ireland, *Irish Wildlife Manuals* No. 25. National Parks & Wildlife Service, DoEHLG. [www.npws.ie/en/PublicationLiterature/IrishWildlifeManuals](http://www.npws.ie/en/PublicationLiterature/IrishWildlifeManuals)

Marnell, F. & Presetnik, P. (2009) Protection of Overground roosts for bats, *EUROBATS Publication Series* No. 4. [www.eurobats.org/publications/publications\\_series.htm](http://www.eurobats.org/publications/publications_series.htm)

Mitchell-Jones, A.J. & A. P. McLeish [Eds.] (2004) *Bat Worker's Manual*, 3<sup>rd</sup> Edition. Joint Nature Conservation Committee Peterborough.

**If a bat is encountered during operations, please stop works and contact your local NPWS Conservation Ranger. The national helpline number is 1800 405 000.**

## Bat Surveys of Buildings

Planning authorities will often request a bat survey of buildings proposed to be demolished or renovated. Such surveys should be undertaken in the summer time (May to mid-September) to determine whether bats are present. Internal inspections of buildings are essential to establish the location of roosting sites while dusk emergence counts are important for confirming what bat species are present, numbers of bats present and exit points being used by bats.

### Timing of Surveys

Bat usage can be very transitional. Therefore, it is essential that structures with suitable roosting sites are surveyed at least in the summer but where necessary, a second survey maybe required documenting seasonal bat usage. In some circumstances, a second survey may be required.

Winter	Spring	Summer	Autumn
optional	optional	recommended	optional

### A BAT'S YEAR (January to December)

J	F	M	A	M	J	J	A	S	O	N	D
Hibernation – bats go into torpor to conserve fat reserves	Bats hungry and active, move from hibernation roosts	Maternity females gather and give birth to a single young	Bats leave summer roosts, mating takes place, prepare for hibernation	Hibernation							

Surveys should aim to establish the following:

1. Identify if bats are present and, where possible, identify the species of bat roosting in the building.
2. Identify exit points and, if possible, the numbers of bats utilising each exit point.
3. Identify commuting routes directly adjacent to the building(s) being surveyed.
4. Identify foraging areas adjacent to the existing building(s).

**The presence of bats in an existing building does not prevent planned works from being carried out. What it does mean is that careful consideration is required in relation to timing of works and materials used to reduce the impact on residing bats.**

Below: Lesser horseshoe bat, an Annex II species



Lesser horseshoe bats (above) hang openly and therefore are visible within the roost. All other Irish bat species are crevice-dwelling bats and often secrete themselves away such as the brown long-eared in the photograph below. This bat is roosting within a stone crevice adjacent to a door frame.



Below: brown long-eared bat in crevice (Photos: Tina Aughney)

## What does bat urine staining look like?



This staining (indicated by arrows) is often present in a regularly used roosting site.



Insect remains such as butterfly wings are often discarded by bats and indicate their presence.



Visible bats: a brown long-eared bat is tucked into a crevice in foam insulation in an attic space

## Remedial timber treatment

Treatment of timber in areas where bats are roosting or can potentially access can be a hazard for bats if the wrong chemicals are used or applied at the wrong time of the year. In the past the use of products such as lindane resulted in mass deaths of bats in attic spaces. However, many of these old style chemicals have been banned and safer chemicals are now used. However, it is essential to check out the ingredient list of the chemical product proposed to be used to ensure that it is safe to use in a bat roost. Sometimes, there is a label that indicates mammal friendly products. Relatively safe chemicals considered safe to use in bat roosts at the correct levels and at the right time of the year are permethrin, cypermethrin and synthetic pyrethroids.

It is preferable to use pre-treated timber, treated with the appropriate bat-safe chemical. This ensures that the timbers used are well dried before being used in the bat roost. Where spraying or painting of chemicals is required on-site, this should be kept to a minimum and undertaken while bats are not present and allowed to dry in-situ for at least 8 weeks before bats return to the roost.

Please consult the BC Ireland leaflet: **Bats & Pesticides: Guidance Notes for Planners, engineers, architects, pest control companies and developers** for further information.

Using good quality, well-seasoned timber in water proof and well ventilated buildings is the best way to avoid timber decay. Hardwood timbers such as oak are durable and sound framing and roof timber. In such conditions, timber treatment may not be needed.

## Common roosting sites in buildings used by Irish bat species

Species	Gable ends	Soffit boards	Ridge tiles	Cavity walls	Barge boards	Ridge beam	Chimney bricks	Window frames	Fascia boards	Roof apex	Roof felt	Crevices
Common pipistrelle	•	•	•	•	•		•	•	•	•	•	
Soprano pipistrelle	•	•	•	•	•		•	•	•	•	•	
Brown long-eared bat	•		•	•			•			•	•	
Lesser horseshoe						•				•		
Natterer's bat				•		•	•			•	•	•
Whiskered bat			•			•	•			•	•	•
Daubenton's bat						•	•			•		•
Leisler's bat				•		•		•	•	•	•	•
Nathusius' pipistrelle		•						•				•
Brandt's bat			•			•	•			•	•	•



Above: examples of typical bat roosting sites – churches, large roof spaces, gaps between roof beams and gable wall, crevices in stonework, stone buildings and spaces between roof felt and slates. (Photos: Tina Aughney & Paul Scott)

## Lighting and buildings

Lighting has increased dramatically over the last number of years with many new developments. This includes aesthetic lighting of bridges, monuments and buildings, flood lighting of sports grounds, street and road lighting and security lighting of urban and rural areas to name but a few.

Contrary to common belief, bats are not blind. Various studies have shown that bats' eyesight works best in dim light conditions. Where there is too much luminance, bats' vision can be reduced resulting in disorientation. Lighting can impact on bats' roosting sites, commuting routes and foraging areas especially along waterways. Too much luminance at bat roosts may cause bats to desert a roost. Light falling on a roost exit point can delay bats from emerging and miss peak levels of insect activity at dusk. Any delays of emergence can reduce feeding periods. Therefore, it is essential that lighting plans for a development site and around known roosts take into consideration the exit points, flight paths and foraging areas for bats and ensure these areas are not illuminated.

Please consult the BCIreland leaflet - **Bats & Lighting: Guidance Notes for Planners, engineers, architects and developers** for further information.



## Maintenance, Repairs and Alterations in buildings with bat roosts

**All bat roosts are protected even when the bats are not present. If the building is a known bat roost and does not require planning permission to undertake proposed works, please contact your local NPWS Conservation Ranger for advice with regards to planned works. Minor works and maintenance can still be planned to avoid disturbing bats or damaging their roosts.**

### Timing

Building works should avoid when bats are most vulnerable to disturbance. If the building is used by bats in the summer months but are not present in the winter, then planned works should be undertaken during the winter months.

### Loft Insulation

Any planned works in the roof void have a potential to impact on bats. Therefore, the instalment loft insulation should be undertaken when bats are not present. It is also important to ensure that bat access points are retained.

### Cavity Wall Insulation

Bats will often use cavity walls and can frequently be present all year around. To avoid entombing bats in cavity walls it is advised to begin insulation from the bottom of the cavity wall and slowly work upwards. This will allow bats a chance to escape. This type of work should also be undertaken during periods of no or low bat activity.

### Re-roofing of buildings

The removal of slates should be confined to the spring and autumn months. Ridge tiles should be removed by hand and checked for roosting bats. Active bats will usually keep out of the way of operations but if a bat is encountered and remains in-situ, a bat box should be erected on a tree near-by and the bat gently relocated to here.

### Repairs to gutters, soffits etc.

Carry out these minor repairs at a time of the year when bats are not present. Ensure that access points are not blocked or altered.

### Access points

Care is required to ensure that planned works do not block access points. If necessary, new access points should be created in vicinity of old access points. Do not place external lighting in vicinity of such access points.

## Roofing Membranes – An important feature in relation to bat roosts

Due to energy efficiency goals, buildings are being made increasingly airtight and better insulated in order to reduce heat loss. Modern living also means that there is greater amount of water vapour in the air and increased air tightness. This water vapour is then forced to travel up through the building into the roof space, where due to cooler temperatures it can form condensation. Traditionally the water vapour was ventilated at the eaves and ridges of the roof, but increasing levels of insulation have made this more difficult. Therefore breathable roofing membranes (BRMs) are promoted to allow this water vapour to escape the roof space via the underlay itself. Before BRMs were used, roofing felt was typically bituminous roofing felts. As buildings age, roofing felts may require changing and the traditional felts are frequently being replaced with breathable roofing membranes (BRMs). However, anecdotal evidence has come to light in recent years about the potential harm of such in roof spaces where bats are roosting.

Breathable roofing membranes (BRMs) are manufactured from layers of non-woven materials that are then bonded through pressure and heat. Whilst there are some differences between products, they are all comprised of very long polypropylene fibres that are used to produce the external layers of the membranes. It is these fibres that have caused concern amongst bat workers. Due to bat crawling movement along the felt and their fine claws, the felt becomes worn and “fuzzy” which can cause bats to become entangled in the loose threads of the membrane, resulting in death.

### EXAMPLES OF PHOTOS OF BATS CAUGHT IN BRMS (PAUL TO SUPPLY)

Type 1F **Blizzard** underslating **roofing felt**

Type 1F BS 747(1994) replaced by BS8747

Please consult this website for further information: <http://www.batsandbrms.co.uk/>

## Demolition Works or Major building alterations

Avoiding damage to existing roosts is the preferred option in all cases. Measures should be undertaken to avoid disturbance at all times.

However, when planned works will result in the loss of a bat roost, a Derogation Licence is required. This should be applied for, with the assistance of a licensed bat specialist, to the NPWS.

Generally the loss of a bat roost will require mitigation measures to replace such roosts. The amount of mitigation required will be determined by the measurable loss of existing roosts as determined by the bat specialist.

This leaflet was originally produced by Bat Conservation Ireland with the assistance of grant funding under the Biodiversity 2010 Grant through the Irish Environmental Network (IEN). The leaflet was updated under the IEN Biodiversity Work Package in 2014.



## Case Study – Creating new access points



**Roost:** Building

**Species present:** Soprano pipistrelles

**Description of Works Completed:** Bat access slits were fitted into the locations of previously recorded access points. The new battens have been designed to allow bats to wriggle out of their roosting space within the attic and find their way to the exit points. The overhanging slate acts as baffle to reduce the amount of droppings sticking on the wall below and also acts as a landing point for the hundreds of soprano pipistrelle bats that use this roost.

Photographs from top to bottom:

Top: Position of slate prior to the instalment of roof felt.

Middle: View of slate access point from exterior wall of building.

Bottom: View of access point within the attic space itself.

Case Study provided by Paul Scott.

Bat Conservation Ireland welcomes any comments on this leaflet. Please send them to [info@batconservationireland.org](mailto:info@batconservationireland.org). Leaflets will be reviewed and updated as required.

[www.batconservationireland.org](http://www.batconservationireland.org)