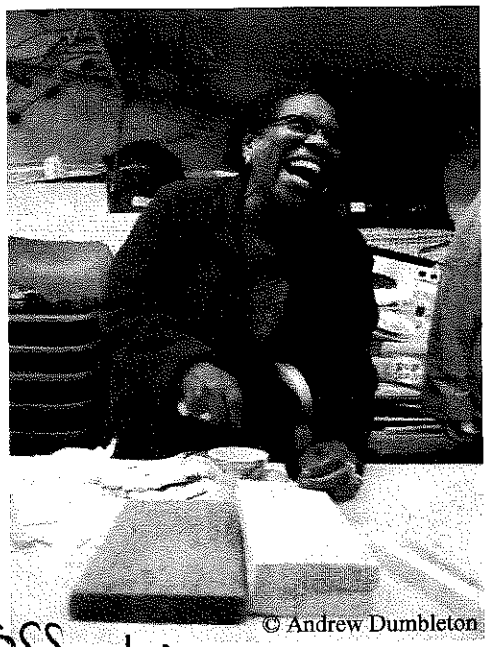
Bat Conservation Trust

www.bats.org.uk

Bat Box Information Pack

Bat boxes are artificial roosts designed to provide bats with alternative resting places. There are various designs of bat box, from wooden boxes that you can make yourself, to ready-assembled boxes and even integrated bat boxes that can be built into walls.



© Andrew Dumbleton

Providing bat boxes can increase opportunities for roosting bats, particularly when they are located where there are few existing roosting sites. However, where a number of suitable alternative roost sites exist it can take a long time for bat boxes to be used regularly and in some cases they may never be used. Even in these situations, bat boxes can have an important additional function in encouraging interest and educating members of the public about bat conservation. The correct design and placement of boxes will help increase the likelihood of their uptake by bats.

Lee Bradley Hazels Cross Kingsley

Bat roost preferences

Bat boxes are now available from many outlets, and in a range of shapes and sizes, so some knowledge of bats' preferences will help you choose the best possible box.

Microclimate within a new roost is a very important factor in terms of increasing the chance of successful uptake by bats. In general, they prefer warm spaces in the summer for rearing young and cooler spaces in the winter for hibernation. The box should be draught proof and made from a thermally stable material such as untreated wood, woodcrete, brick or stone. If possible, it is better to provide several internal chambers so that the bats can move around as their needs change.

Although, it can take bats a long time to make use of artificial roosts, bat box location seems to be the most important factor influencing successful uptake.

© Hugh Clark

Bat box chosen Page 7
to be Placed in trees Fence

Orientation and location

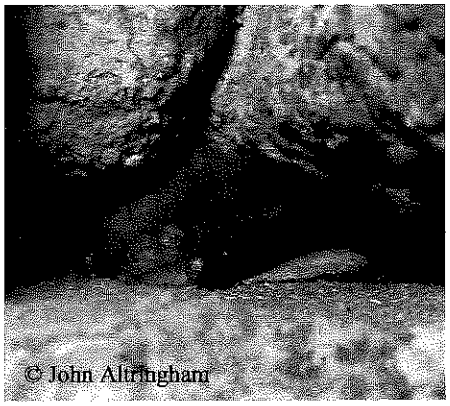
Lack of warmth is the most important known cause of bat box failure, and structures for summer roosting should be positioned where they are unshaded for most of the day. Summer maternity roosts (in the northern hemisphere) should have a southerly or westerly aspect. On average we estimate that the bat box should receive 6-10 hours of direct sunlight a day if possible. It is always best to provide a number of different options for bats so that they can choose the most appropriate temperature based on their needs. This can be achieved by grouping a number of bat boxes each with a different aspect, for example around the trunk of a tree (see 'putting up bat boxes' below).

Size of the bat box

It is important that the type of bat box should be appropriate to the species it is aimed at. The most frequently used bat boxes are small and only suitable for crevice-dwelling bat species. Some species such as horseshoe bats and grey long-eared bats do not use bat boxes.

Access

Crevice dwelling bats crawl into their roosts via small gaps in the range of 15-20mm high. Roughened surfaces or landing areas allow better access though landing perches should be avoided as these are not necessary, may even deter bats and encourage birds to nest within the bat box. It is important to locate access points where they are unobstructed but close to sizeable vegetation and flight lines. This allows bats to emerge earlier and forage longer.



Other considerations

Bats are nocturnal and adapted to low light conditions. Artificial light sources should not be directed onto bat boxes or flight paths as most bat species find artificial lighting very disturbing.

Types of bat boxes

Bat boxes come in many forms depending on their materials, function and location. Simple bat boxes are available commercially or can be home-made. They can be divided into the following categories: woodcrete external bat boxes, wooden external bat boxes and integrated bat boxes. Advanced forms of artificial roost creation include bat houses, bat barns and internal bat lofts (if you are interested in these please refer to the websites and publications listed at the end of this document).

Woodcrete external bat box

Woodcrete (a mixture of wood and concrete) bat boxes have the advantage of being more durable so will not need to be replaced for many years. There are two basic types of woodcrete bat box:

- Cylindrical with an access hole in the front and designed to be hung on tree branches with a wire loop.
- Brick-shaped, usually with narrow roosting crevices inside and an entry slit at the bottom, designed to be fixed to trees or flat surfaces such as walls of buildings.

If possible, purchase boxes with an entrance slit along the bottom so that accumulated bat waste can drop out of the box or be pushed out as bats emerge. Bat boxes with entrance holes in the middle will need to be cleaned regularly by a licensed bat worker (see 'monitoring bat boxes' below).

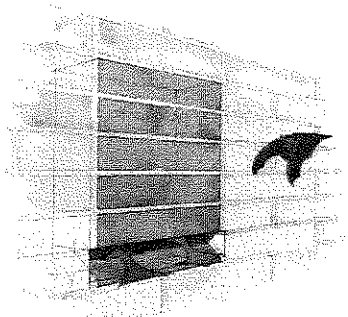
Wooden external bat boxes

External bat boxes are usually located on trees or outside walls of buildings. The most common types of bat boxes are made from wood. Wooden bat boxes are usually cubic or wedge-shaped, with a grooved 'bat ladder' and a narrow entrance slit at the bottom. These will last for approximately ten years and can either be bought ready-made, in kit form, or you can make your own from scratch (there are instructions for the 'The Kent Bat Box' and 'The CJM Bat Box' in the appendices of this document). They come in a variety of shapes but key requirements are:

- The wood should be rough sawn for grip and untreated on the inside.
- To protect against moisture, air leaks and wood deterioration, apply one coat of primer to all outer surfaces, including vent openings, landings and entry areas. Follow that with two coats of flat exterior, water-based paint or stain. Do not use oil-based products. Consult Natural England's guide for safe timber treatment products (TIN092).
- In cool climates bat boxes should be painted or stained black or a dark colour using non-toxic coatings.
- Bats do not like draughts. The entrance slit should be no more than 15-20mm wide, and there should be no gaps where the sides and top join. A box that cannot be opened from the top is best, as it will have fewer gaps for draughts, and will lessen the chances of the bats being disturbed. (Bats may unintentionally be injured if the box is opened, for example by damaging their feet and legs. A special licence is required in the UK to disturb bats and to handle them – see 'monitoring bat boxes' below)
- One of the most successful wooden bat boxes is the Kent bat box. These boxes are not available commercially but are very easy to make yourself (see instructions in the appendix).

Integrated bat boxes

Integral or integrated bat boxes can be built into the walls or masonry of houses and other buildings. The boxes can be embedded such that they do not impair the air-tightness of the building. Many designs are available including some that have bespoke coverings that can match the building façade. The same rules for size, location and access apply.



Habitat, enhancing home for bat boxes.
© Ecosurv

Putting up bat boxes

How many boxes?

Ideally, put up two or three boxes facing in different directions to provide a range of temperature conditions. For example, boxes facing from south-east to south-west allow the sun to fall on each box for part of the day. During very hot days a south-facing box may overheat, but the other boxes should have some shade.

Two or three boxes will always be preferable to one, although a single box has a chance of being used depending on the bat species that use the local area. Three boxes can be arranged around the trunk of larger trees.

To increase the chance of it being used, locate the box at a site where bats are known to feed, that is sheltered from strong winds and exposed to the sun for part of the day. Most maternity roosts are located within a short distance of permanent fresh water, preferably a stream, pond, river or lake. Bat boxes are more likely to succeed in areas where bats are frequently found in buildings and where there is a good mixture of habitat including trees and nearby water especially if there is good habitat for feeding bats but few roosting opportunities. (See below for more information on other things you can do to encourage bats.)

Bat boxes may be more successful if located close to a linear feature such as a line of trees or hedgerow. Some bat species use these features for navigation between their roosting sites and feeding grounds and to avoid flying in open and exposed areas. Ensure the bats approach to the box is not impeded, for example by branches – clear away underneath the box so the bats can land easily before crawling up into the box.

On trees

Most species will use higher positioned boxes (around 5m high), although brown long-eared bats may use a box 1.5m above the ground. If you are locating boxes in public areas, consider the risks of vandalism and of the box being accessible to cats. Place the box as high as it is safe to. Consideration should be given to tree growth and boxes may need rehanging over time. Use headless or domed nails not fully hammered home to allow the tree to push the box off without splitting, or strap the box to the tree. Iron nails can be used on trees with no commercial value. Copper nails can be used on conifers, but aluminium alloy nails are less likely to damage saws and chipping machinery.

On buildings

Placing the boxes high up by the eaves on a building will reduce the likelihood of the bats falling prey to cats or humans. As with trees, the aspect of the box should capture sun for part of the day.

Gazebos, garden walls and sheds have been suggested as sites for bat boxes. However, the main danger is that the boxes are not high enough above the ground and are too visible to predators.

On poles

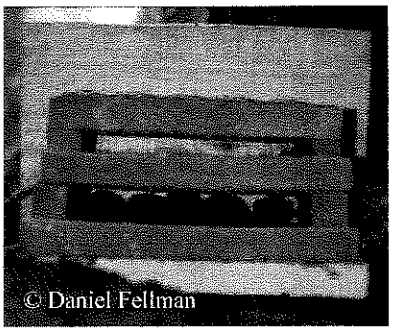
American style bat houses (larger, multi-chambered boxes) have been successfully used for bat conservation in North America and elsewhere. These are increasingly being used in the UK with some success. Some designs are suitable for the sides of buildings or they can be put up on poles. More information on the design of these bat houses can be found in 'The Bat House Builder's Handbook' produced by Bat Conservation International (referenced in the Publications section at the end of this document). Some commercial designs are also available.

Monitoring bat boxes

Making and putting up bat boxes is a great conservation action but what is even more useful is to know whether they are being used, when and by which species.

How long before bats will use the box?

Sometimes it may take several years for the bats to find the box. Be patient!



It is highly unlikely bats will shift their roost from a well-used site to a newly positioned box and there may be plenty of other suitable roosting sites in the area. However, at other times bats will use the box within a few months, and if you are extremely lucky, maybe even within a few weeks!

How will I know if the box has been successful?

To check if the box is being used, look out for droppings, urine staining, listen for 'chattering' and watch the box for an hour either side of sunset to observe any bats leaving to feed.

Licensing

You can undertake the checks above without needing a licence. However, if the box needs to be opened to check it then there must be a suitably licensed bat worker present. Anyone wishing to undertake bat box checks should obtain training in bat handling and identification before applying for a licence. You can find out more about licensing and bats on the Bat Conservation Trust website at: www.bats.org.uk/pages/licensing.html

All bats and their roosts are protected by law and it is an offence to deliberately disturb, handle or kill bats. The relevant legislation in England & Wales is the Wildlife and Countryside Act 1981 and Conservation of Habitats & Species Regulations 2010 (as amended). In Scotland it is the Conservation (Natural Habitats, etc.) Regulations 1994 and in Northern Ireland the Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.

A bed without breakfast?

Bats often use features such as hedgerows, tree lines and waterways as commuting pathways between roosts and foraging areas. This type of habitat also provides shelter, allowing insects to gather and therefore support foraging bats. The highest densities of bats occur where insects are most plentiful.

Make sure you maintain or create good foraging habitats for bats by planting a wide range of plants such as flowers that vary not only in colour and fragrance, but also in shape. The addition of water (for example a pond) and deadwood to a garden will also increase the variety of invertebrates that your garden can sustain, providing food for bats. See BCT's 'Encouraging Bats' leaflet for more information (available from www.bats.org.uk\publications).

t Box Supplier Websites

re is a wide variety of commercially available bat boxes in a wide range of shapes, sizes and erials. These are available through NHBS (www.nhbs.com), CJ Wildlife w.birdfood.co.uk/pro), Amazon (www.amazon.co.uk), The Nestbox Company w.nestbox.co.uk) and a range of alternative suppliers. Please be aware that BCT does not orse any particular product or brand.

ibat www.habibat.co.uk

ibat is a partnership between the Bat Conservation Trust, Ecosurv and customers. Their aim provide bat boxes that work for bats and buildings. A portion of the profits from each ibat sold is reinvested into the Habibat scheme to improve accommodation for bats through itoring and research. They will be improving knowledge of integrated bat boxes, monitoring ke, refining our bat box design and giving their customers guidance on installation.

her Useful Websites

Conservation Trust www.bats.org.uk

Bat Conservation Trust (BCT) is working towards a world where bats and people thrive in nony, to ensure they are around for future generations to enjoy. BCT is the only organisation ly devoted to bat conservation in the UK.

st roost.bats.org.uk

st is a resource developed by the Bat Conservation Trust (BCT) to aid in the gathering of rmation on bat roost mitigation, compensation and enhancement techniques. The aim for this is to provide accessible information to support everyone involved in bat conservation and elopment. The site is useful for those involved in projects which require mitigation for loss of roosts, and for those who wish to provide additional resources for bats in buildings.

Conservation International www.batcon.org

Conservation International's mission is to conserve the world's bats and their ecosystems to ure a healthy planet. Based in Austin, Texas, BCI is devoted to conservation, education and arch initiatives involving bats and the ecosystems they serve.

cent Wildlife Trust www.vwt.org.uk

Vincent Wildlife Trust (VWT) is an independent charitable body founded by Vincent Weir 975 and has been supporting wildlife conservation ever since. They conserve a range of angered mammals through management their own reserves, undertake pioneering research provide expert advice to others through practical demonstration.

blications

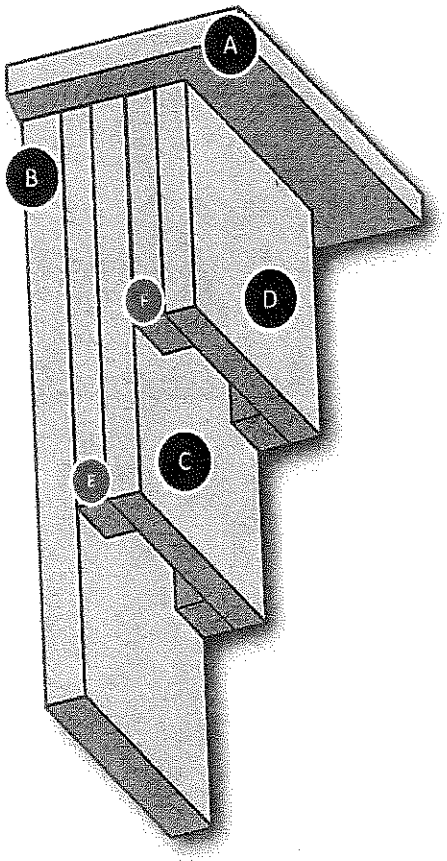
nell, K., Murphy, B. and Williams, C. (2013) Designing for biodiversity: a technical guide new and existing buildings

nell, K., Grant, G. and Williams C. (2012) Landscape and urban design for bats and diversity

Appendix A: The Kent Bat Box (D.I.Y. instructions)

Design and measurements

Simple to construct, self-cleaning and low maintenance, the Kent bat box (designed by the Kent Bat Group) is a great extra home for bats to hang out and rest on a hunting night out. These boxes won't be spacious enough to be used as maternity roosts but are a great way to encourage bats in your garden or your green space. The box should be rainproof and draught-free



The only critical measurement is the width of the crevices: between 15-20mm. Other measurements are approximate. Timber should be approximately 20mm thick.

Measurements for one Kent bat box kit would be as follows:

Part	Quantity	Size (mm)
Roof (A)	1	250 x 160 x 20
Back (B)	1	450 x 200 x 20
Centre (C)	1	330 x 200 x 20
Front (D)	1	210 x 200 x 20
Centre Rails (E)	2	330 x 20 x 20
Front Rails (F)	2	210 x 15 x 15
Stand-offs (optional)	2	200 x 20 x 20

Material and Tools

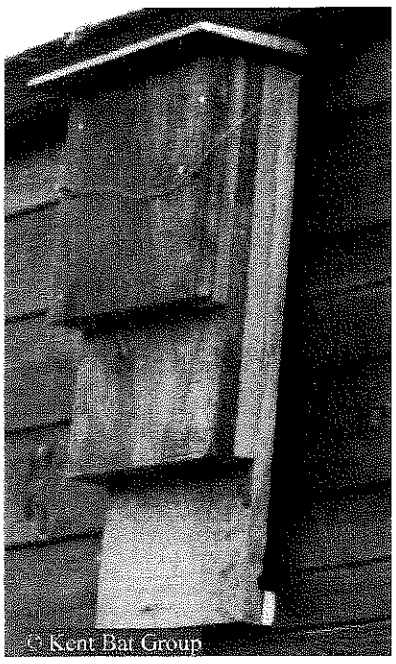
This kit requires approximately 1.6m of rough wood and 25 screws (8 x 1 ½ inches) to assemble. You can rough it up by scraping with a suitable tool – possibly a saw blade or even a screwdriver but make sure you use untreated wood as some preservative chemicals can kill bats.

Pre-drill the holes to prevent the wood splitting. The hanging screws may either be at the edges of the front panel or in the side centre block (not in the rails!). Fixing may be by use of brackets, durable nylon cord or wires. Alternatively you can assemble your bat box kit with nails although they tend to be less robust than boxes made with screws.

This design has been developed by Kent Bat Group

We'd like to know how successful it is. Please send any comments or records of bats seen using it to: records@kentbatgroup.org.uk

With thanks to Glen Sharman for help in prototype and Lloyd Bore for providing plans.



Kent Bat Group

www.kentbatgroup.org.uk

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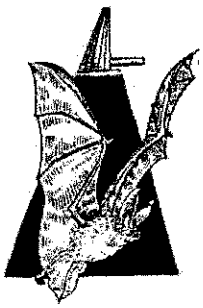


Appendix B: The CJM Bat Box (D.I.Y. instructions)

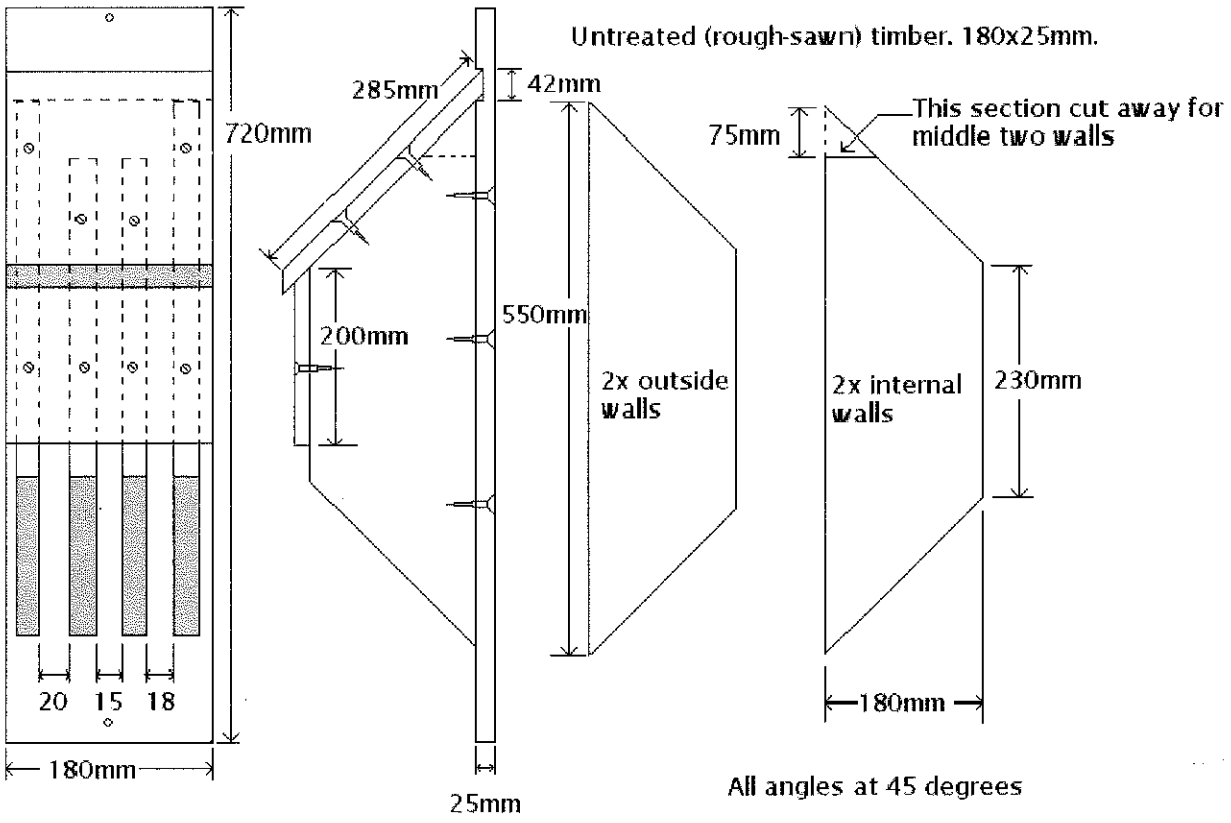
The CJM bat box was designed to imitate niches where crevice dwelling bats might roost; such as a split in a tree trunk or behind loose bark. This design was created for woodland habitats and has proven to be successful with several different species in woodland studies.

This design requires no maintenance as the open bottom allows droppings to fall from the box.

The three vertical 'slots' each of a different width, offers a choice that several species of bat, depending on their size, might use. The upper section of the two partition walls have been cut away to allow bats an area to cluster, conserve energy and breed.

These simple drawings are all you need to build one yourself. Please contact Colin Morris at The Vincent Wildlife Trust if you require any more information: colinmorris@vwt.org.uk

All the timber used is untreated, rough-sawn 180mm x 25mm.



The Vincent Wildlife Trust