

In many urban house blocks and parks, older trees containing hollows have been removed. This leaves fewer places for hollow-dwelling species such as parrots, possums and bats to breed and rest in safety.

Artificial boxes attached to trees give microbats a safe, dry refuge in which to roost during the day.



Gould's Wattleed Bats (*Chalinolobus gouldii*) in a bat box.

## What is a bat roost box?

A bat box is a type of artificial hollow that provides protection for bats during the day. A typical bat roost box has a narrow entrance slit at the bottom, a landing plate extending below the entrance, an internal cavity able to hold a typical-size group (1 to 50 bats), horizontal saw grooves on the internal surfaces so bats can grip on and move about, and a hinged lid so you can check what's inside and evict any unwanted visitors.



## Designing a bat box

### Size

A good size for a box is about 500 mm tall x 400 mm wide x 50 mm deep. Boxes with larger internal spaces will attract larger groups of bats, so it's good to set out a variety of sizes of boxes to accommodate a range of group sizes.

### Entrance slits

Bats prefer to enter from the bottom so entrance slits should be on the underside (unlike boxes for birds and possums, which have circular side entrances). By providing a variety of boxes with small slits (12 mm) and larger slits (15 – 20 mm), you can allow for different-sized bat species to use separate boxes.

### Design

Rectangular boxes are easy to assemble with stainless steel or galvanised nails or screws. Hardwood is preferable because of its durability, but if cost is a limiting factor, pine or marine plywood may last up to a decade – it's important to use only untreated wood. Recycled HDPE plastic board is now being used to make boxes designed to last 30+ years.

Make sure that the front and back plates have horizontal saw-grooves cut on the inside of the box, to enable bats to hang upside down and to move about inside the box. The rear plate extends above and below the box for ease of attachment and as a bat landing plate. To attach the box to a tree, galvanised coach screws are best, as they corrode more slowly, but even they will slowly disappear into the back plate recesses as the tree grows. Straps around trees is another option, but these must be loosened as trees grow.

## Colour

Painting the outside of boxes with good quality UV-proof exterior paint will extend the life of the box. However, paint colour can strongly influence temperatures inside boxes: dark-coloured boxes get much hotter than light-coloured boxes. Avoid installing dark-coloured boxes facing north in areas with little shade, as boxes can get extremely hot (over 50°C) during summer.

## Fun Fact!

Bats can live a very long time. Most bats live between 6 and 8 years. Some bats can live up to 30 years!





## Installing bat boxes

### Location

Bats eat insects, which are more abundant near fresh water. So even though they can fly several kilometres to feeding sites, they generally prefer to roost in boxes that are near water.

Bat boxes can be successfully installed in urban house blocks, roadsides, farm or bushland areas. Boxes should be placed high enough in trees to prevent vandalism, and protect the bats from predators and extreme flood events: 4-6 m up is ideal.

### Selecting the right trees

Trees with a minimum diameter of 30 cm at 6 m height provide a good strong base for a heavy box. Select trees with no branches below 6 m so there is no clutter obstructing bat entry and exit. Smooth-barked trees are preferable because you can easily remove bark strips before installing a box. Ease of access for maintenance is important, so the surrounding bush should be clear enough to enable a long ladder to be moved around.

### Orientation and density

Bats live in dense colonies and prefer having many roosts within a short distance of one another; they can change roost daily in response to temperatures, parasites, and to avoid predators. It is worth putting up a selection of boxes facing all major compass points - certain orientations seem to be preferred (primarily NE to SE-facing), but this varies seasonally for temperature control.



## Maintaining bat boxes

Boxes should be checked several times a year to ensure they are still usable by bats.

### Corrosion and decay

Boxes will not last forever as wind, rain and tree growth cause decay of various sorts. You're doing well if a box lasts 10 years without maintenance. Boxes fall, side panels split, lids warp, wood rots around screw holes, paint peels, possums and cockatoos may chew entrances to enlarge them. Hinges corrode and warp, screws push through the hinge-holes, and falling branches knock bits off lids. Bolts rust onto trees and become immovable so they can't be adjusted as the tree grows. Bark accumulates behind boxes.



### Ants

Ant infestation can be a major problem for some boxes. It's important to check the tree regularly for signs of a resident ant colony (e.g., large numbers of ants moving along the trunk). Temporarily propping the lid of the box open will make it less appealing to the ants, but they are likely to move back in once the lid is closed. Pest strips are not recommended as the bats may also be poisoned, due to their small size.

## Monitoring bat boxes

Consider joining an existing program or set up your own. You will need a wildlife research permit from your state government conservation department to check the boxes and handle bats. Rabies vaccinations are essential.

If you install a bat box in your backyard and want to see if bats are using it, put a tray underneath and check for droppings falling out of the box, or sit and watch for emerging bats on dusk.

**Why aren't there bats in my box yet?** Unlike other mammals and birds that take up residence very quickly, bats can take years to recognise boxes as a suitable place to roost, especially in areas where there are not already established boxes. Patience is key. Adding bat guano to a box so it smells like a roost might speed the process along, but the jury is still out on this.

## Bat boxes as a conservation tool

Research by ABS members has shown that bat boxes tend to become occupied by common and hardy, not rare or threatened species. So, while bat boxes are a great way to get engaged with Australia's microbats, they are not a substitute for natural tree hollows, and the loss of big old trees continues to pose a threat to our hollow-dependent wildlife.

**Looking for more information about bats?**  
**See our fact sheets:**  
[www.ausbats.org.au](http://www.ausbats.org.au)