

In many urban house blocks and parks, most of the 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.

What is a bat roost box?

A bat box is a simulated natural hollow that provides protection for bats during the day. A typical bat roost box has a narrow entrance slit at the bottom to exclude predators, a landing plate extending below the entrance, an internal cavity able to hold a typical-size bat group (1 to 50 bats), saw grooves on the internal surfaces so bats can grip on and move about, hinged lid so researchers can see what's inside, and a painted number to support record-keeping.



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

Designing a bat box

Size

A good size for a box is about 250 mm tall x 150 mm wide x 100 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 entrances on the side). 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 nails, screws, dowels and glue. Hardwood is preferable because of its durability, but if cost is an option, pine or plywood may last a decade – it's important to use only untreated wood, however. Make sure that the front and back plates are saw-grooved on the inside of the box, to enable bats to hang upside down easily 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, coach screws are better than screws or nails, 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.

Installing bat boxes

Location

Bats eat insects, which are more abundant near water (pools or streams), so bats prefer to roost in boxes that are near water, even though they may fly several kilometres between roosting and feeding sites.

Bat roost boxes can be successfully installed in urban house blocks or in bushland that are close to water, whereas boxes in house sites at the tops of hills are less likely to be used. Boxes should be placed high enough in trees to prevent vandalism, and protect the bats from predators and extreme flood events.

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!



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 monitoring and maintenance is important, so the surrounding bush should be clear enough to enable a long ladder to be moved around easily.

Orientation and density

Bats live in dense colonies and prefer having many roosts within a short distance of one another, including having 1-2 boxes per tree. Bats often move roost sites daily, and choose a roost with the most appropriate temperature each day. It is worth putting up a selection of boxes facing all major compass points as bats' needs vary through the seasons, mainly for temperature control. Bats seem to prefer certain orientations (primarily NE to SE-facing), but this varies seasonally. We recommend installing many boxes, so they always have a large selection of roosts from which to choose. If you find that every box in your installation is occupied, you should install more boxes in the area, especially when new colonies are growing (for example in areas of regrowth woodland lacking natural hollows). If you are putting boxes up in your backyard, even one or two boxes will contribute to the available roosts in your area.



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. Piano 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 is a major problem and some boxes are frequently infested, while others are rarely affected. We sometimes find several thousand ants, with young and eggs, in a box, and the ants often block the entrance to secure their colony. It's important to regularly check the tree for signs of a resident ant colony moving up and down the trunk. Solutions for eradicating ants include sprinkling with talcum powder, and temporarily propping the box open to make it less appealing to the ant population. Pest strips are not recommended as the bats may also be poisoned, due to their small size.



White-striped Freetail Bat (*Tadarida australis*) is one of the more common species using bat boxes in Melbourne.

Monitoring bat boxes

- Consider joining an existing long-term monitoring program. In the Melbourne area, bat boxes are regularly checked at Organ Pipes National Park and at Wilson Reserve in Ivanhoe. Volunteers can be trained by qualified bat biologists, to assist with recording data, weighing and measuring bats, and checking the condition of bat boxes. Rabies vaccinations are essential for volunteers to be able to handle bats safely.
- If you want to set up your own bat box program, you will need a wildlife research permit from your state government conservation department (e.g. the Victorian Department of Sustainability and Environment), to check the boxes and handle any bats.
- If you install a bat box in your backyard and want to see if bats are using it, put a tray underneath (near ground level) and check for droppings falling out of the box, or sit and watch for emerging bats on dusk.

Looking for more information about bats?
See our fact sheets: www.ausbats.org.au

Publisher: Australasian Bat Society Inc.

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