

Nest boxes for wildlife

Land for Wildlife Note No. 14

LIBRARY
DEPARTMENT OF ENVIRONMENT
& CONSERVATION
WESTERN AUSTRALIA
October 1991



Key words: nest boxes, mammals, birds, amphibians, reptiles - artificial hollows
W: 12-Ex-14

Area: Statewide
Author: WB

The role of nest boxes

A range of native animals require the natural hollows that develop in trees and some shrubs for shelter and/or breeding. A comprehensive list is given in Land for Wildlife Note No. 6 'Wildlife needs natural tree hollows'.

The nest boxes described in this Note are not the equivalent of natural hollows. Natural hollows occur in vegetation at a specific time in the development of the plant community. If the plant community is severely disturbed, merely replacing hollows with a substitute is no compensation for the other changes to that habitat such as disruption and loss of food sources from understorey shrubs and interference with the natural cycles that maintain the health of the ecosystem. It takes over 100 years for natural hollows to develop. Many eucalypts live for hundreds of years providing safe hollows for many generations. The nest boxes described here will last up to ten years.

Nest boxes are used by people who want to observe the wildlife occurring in their area and something of its natural history in a convenient location. In some instances nest boxes have been used as substitutes for a lack of natural hollows and as a research tool. Once again, it should be emphasized that artificial hollows are no substitute for real hollows. As a first step in assisting wildlife you should consider how natural hollows can be protected in your area and make provision for the development of natural hollows, should they be in short supply, by re-establishing local native vegetation. Natural hollows are often destroyed during firewood collection, fencepost cutting, land clearance, burning and timber harvesting. Think about how you might reduce the impact of these practices in your area. DON'T use hollow logs for nest boxes. Natural hollows are valuable resources for wildlife and should be left in place on a tree or on the ground.

How do I build a nest box?

General nest box requirements

A space will allow for ventilation.

For weather protection the lid must slope from the back and overhang the front by at least 25mm. It should also overhang the sides. DO NOT use sheet metal on the lid, timber has superior insulating qualities.

20mm deep woodshavings, decayed wood or shredded bark should cover the floor.

Fix a mounting strip to blocks attached to the back of the box to make attachment to a tree trunk easier. Pre-drill nail holes in the strip to prevent splitting and use 100mm galvanized flat-head nails.

Box must be stable. A slight forward lean will assist drainage and exit by young.

Place box at least 3m above ground.

Arrange timber so that growth rings radiate away from the centre of the box. Subsequent 'warping' will force the box together rather than apart.

A hinged lid or front panel extending 2/3 depth of the box and angle cut for drainage permits inspection and cleaning out after use.

Use galvanised/nickel-plated screws to join all parts.

Nesting boxes are best made from rough-sawn plantation-grown timber so animals can get a grip and should be about 19-25mm thick to provide insulation. DO NOT use treated timber, toxic paints, chipboard, smelly glues or leave any sharp objects such as projecting nails or screws. Avoid wood that is inclined to warp.

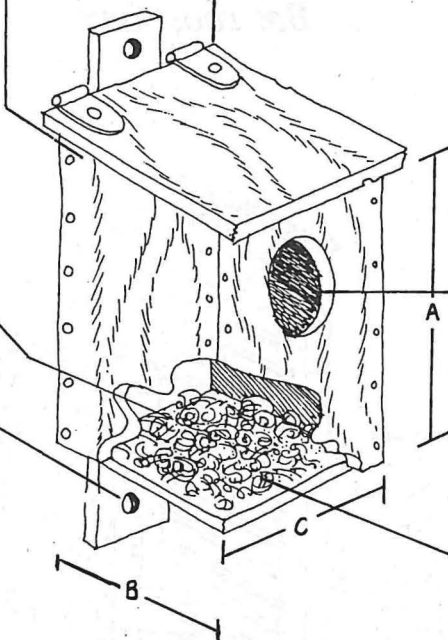
Entrance hole should be no bigger than is necessary for the animal the box is intended to house (a critical dimension). Placing the hole near the top will ensure that inside of box is dark.

Inside walls must have toe holds so the young can climb out. Use rough-sawn timber, roughen up with coarse sandpaper or notch with a circular saw before assembly.

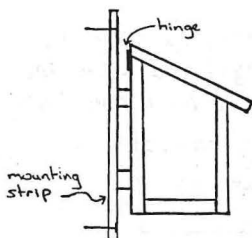
Three small (<10mm) drainage holes should be drilled in the floor towards the front (lower side). Avoid creating an updraft.

Box must be weatherproof and dark inside.

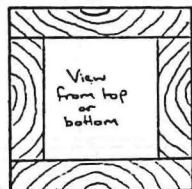
Other designs - over



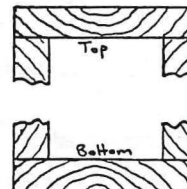
Floor should be recessed inside walls, loose knots glued in place with PVA (non toxic) and any gaps that do occur sealed with a quality mastic.



Side view



Layout of wood showing grain orientation to compensate for cupping (warping).



After assembly, paint the outside of the box with three coats of non-toxic dark-coloured outdoor water-based acrylic paint.



Inside dimensions (all in millimetres):

All depths are minimum. Many other native species use hollows. See Note 6 for a complete list.

Some species that will use the general nest box design

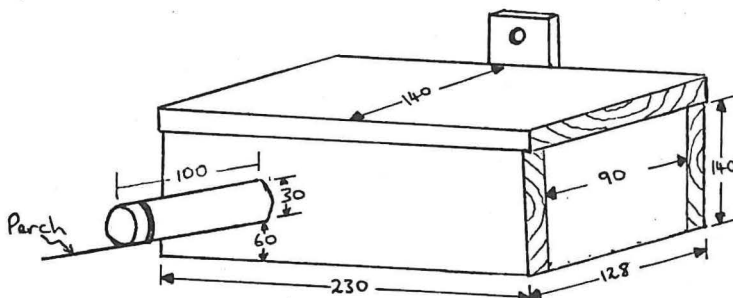
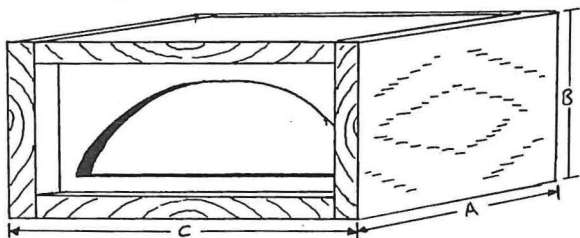
	A (height)	B (depth)	C (width)	D Entrance
Brushtail Possum (also suits ducks)	500	250	290	100-120
Ringtail Possum	400	240	200	70-80
Sugar Glider/Tuan	400	240	200	32-35/35-40
Rosellas	400	240	200	70
Red-rumped Parrot	400	190	170	60
Treecreepers	400	190	170	45-50
Owlet nightjar	400	190	170	45-50
Ducks - Grey Teal, Chestnut Teal	500	250	290	100
Black duck	"	"	"	130

Horizontal box for Kookaburras, etc.

Young kookaburras and other kingfishers need to excrete from the front of the box so a small sill (<40mm, don't forget to allow for shavings) is desirable. Notes as for general design.

Box for pardalotes

Internal diameter of entrance pipe must be 30mm. (Class 12, 25mm water pipe has ID = 30, OD = 32)



Species using horizontal box

A (depth) B (height) C (width)

Laughing Kookaburra	600	150-200	290
Grey Shrike Thrush (lid on box not essential)	200-300	150-200	150-200

Bat roost box

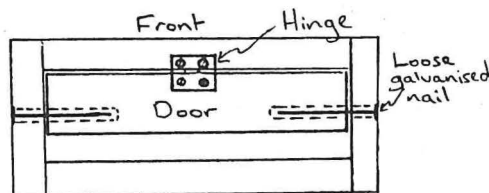
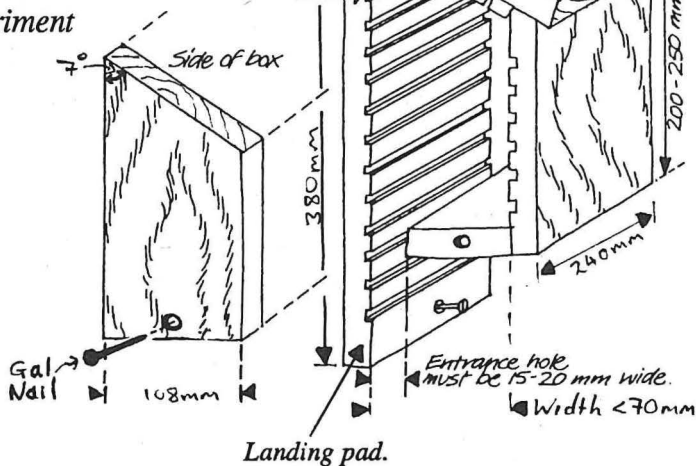
Comments for general box design plus:

Bats prefer an entrance at the bottom, hence the alternative design.

Roughen all internal surfaces with shallow, horizontal saw cuts.

Use 25mm rough-sawn timber.

You could experiment with hanging some hessian from the inside roof or reduce the cavity.



Bottom view

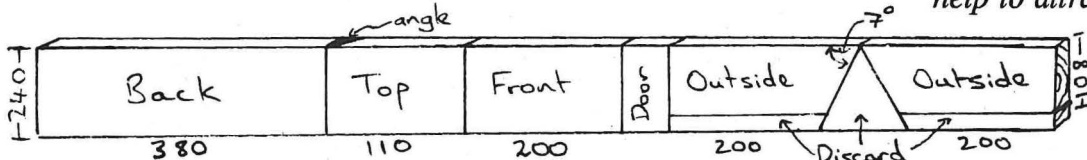
There must be a tight seal at all joints to avoid draughts.

Install on tree, clear of branches, or on wall of house, under eave.

Internal dividers and greater dimensions will potentially house a larger colony. Bats prefer tight surrounds.

Don't open the box when it is occupied by bats. Watch at dusk for exit of bats.

Spraying the box with guano (bat droppings) and water may help to attract bats.



A single bat box can be cut from a length of timber as shown above.

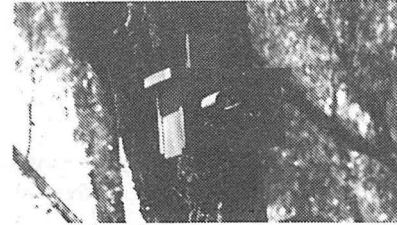
Where do I place the nest box?

Nest boxes should be placed out of reach of human hands, to avoid vandalism, and potential predators, such as cats. The site may be in a tree or dense shrub or an inaccessible place around a dam, swamp or over water (these boxes will only be used by birds). Some species, such as bats, may prefer a more open site. Duck boxes don't have to be over water. If you are fortunate enough to have bats move into your bat box, you could find that the local mosquito problem is largely taken care of whilst they are there.

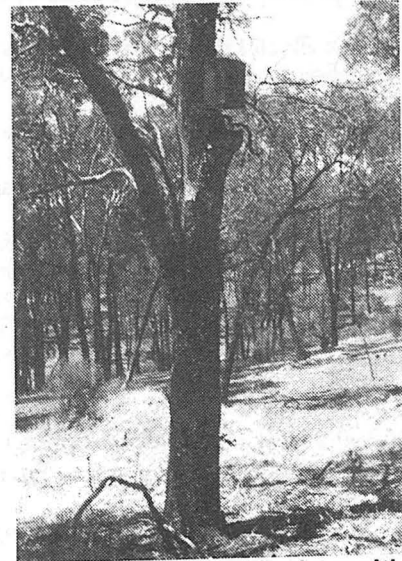
The nest box should be given protection from weather, including cold, rain and the direct heat of the sun. Fixing boxes just south of east, about 110° magnetic, has been found to be satisfactory. Bats may appreciate some warmth, particularly in cool climates. You may need to try various orientations and exposure. The entrance should face away from prevailing winds and rain.

The nest box must be firmly attached to its support. 100 mm galvanised nails can be used. Any type of strapping around the supporting plant must take account of the future growth of the plant and so is best avoided. Place a nail in the tree first to support the box then lift the nest box onto it and finish attachment.

Read all you can about the natural nest site of the species for which your box is intended and try to imitate this as much as possible. Some experimentation with box design and placement may be necessary. Note that some mammals, such as Phascogales, can have large litters and build substantial nests. These species may need a box size that is much greater than needed for one animal. You might like to design boxes for species not shown in this Note, such as goannas and Yellow-bellied Gliders.



Pardalote box



Sugar Glider nest box in position on a tree trunk

Problems you might encounter.

Pest species are a major concern. Starlings, mynas, sparrows, honey bees, Black Rats, feral cats and other introduced species may take advantage of the nest box. Their occupation of natural hollows is a concern for the conservation of wildlife. These species may be humanely destroyed. Natural nest predators, including owls, goannas and hawks are a part of the natural ecosystem and may be themselves endangered by introduced species. They are protected native wildlife and must not be harmed.

Regular (weekly) inspection of the nest box is necessary to prevent its use by pest species. Should a nest box be frequented by a pest species you may need to close it off for a period, remove the nesting materials and/or eggs of a pest bird and close the box for a period, control access by selection of an appropriate entrance hole size (70mm prevents Brush-tailed Possums, 45mm prevents Common Mynas, 35-40mm prevents Starlings, 28mm prevents House Sparrows and 26mm prevents Tree Sparrows), completely remove the box and look for an alternative location or desist from using nest boxes and concentrate on habitat protection and production. If Starlings are seen in a box, check to see that they haven't removed nesting material. Parrots do not provide their own nesting material and so you may need to replace it. Black Rats will be home during the day when they can be caught. Unlike most native animals Black Rats build nests using any suitable material including man-made materials such as newspaper. Phascogales and *Antechinus* may also use a variety of materials so it is best not to discard the nest until you are certain of its occupant's identity. Honey Bees can be removed by suspending a pest strip, such as 'Shelltox', on a wire inside the box for a couple of days. Place the strip inside the box at night when the cold will keep the bees quiet. This will kill the bees and they will have to be removed. Alternatively, see if a local apiarist will remove the bees. Remember that pest species have a major impact on native wildlife through competition for scarce resources and predation. Please do not give them any assistance. If nest boxes are placed within a woodland or open forest habitat, greater than sixty metres from the edge, they will not be used by Starlings, mynas or sparrows. We recommend that you DO NOT feed wildlife. Placing a feeding station within a nesting territory (approx 50 metre radius for rosellas) will disturb nesting activity as the nest guardians will waste time chasing away other species tempted by the food source.

Once a nest box is occupied by a native species, the temptation to look inside the box should be avoided. Regular observation from outside will indicate what is going on. You might like to keep a log of these observations. Frequent inspection is very likely to lead to desertion of the nest box.

Don't be surprised if your box isn't used for some time. Wildlife, such as rosellas, may use the nest box almost immediately, if erected at the correct time (late Winter-early Spring for rosellas). Other species may take longer.

Note that under the *Wildlife Act 1975* it is illegal to be in possession of protected wildlife. This means that you cannot interfere with or restrain protected wildlife in any way.

Living with Possums

Under natural conditions the Common Brushtail Possum makes its den in a tree hollow. However, it may also seek daytime shelter in the roof of a house, particularly where natural hollows are in short supply. Nest boxes can form part of the solution to ridding a house of this possum. Note that Common Brushtail Possums are territorial. Removing a possum from your roof without taking any further steps will simply leave a vacant territory which may soon be re-occupied by another possum. The Common Ringtail Possum usually builds a nest or drey of twigs and leaves, in dense foliage such as Paperbarks, a few metres above the ground. It seldom enters house roofs.

Like all other native animals, possums are protected under the *Wildlife Act 1975*. They must not be harmed in any way or retained without an authority from the Department of Conservation and Environment.

To live with possums:

1. Block all access to your roof by placing collars made from sheet iron, 60cm wide and 60cm above the ground, around the trunks of all trees giving access to the roof or lopping branches which lead to the roof.
2. Make or buy a nest box and install it nearby as an alternative den site for the possum.
3. Block all known entrance points to the roof once possums have left. If you cut off all known access points, as in 1 above, possums will still be able to leave but not return.

Collars can also be used to keep possums out of fruit trees. Ornamental plants or fruit being eaten by possums may be protected by placing blood and bone fertiliser around the base of plants or by making a solution of hot english mustard (mustard powder and water) which can be sprayed or painted on the affected fruits or foliage.

Trapping and removal of possums is not recommended. Released possums may displace other wildlife from hollows, they may cause problems for plants in release areas through overbrowsing or may be killed by cars, foxes or dogs as they attempt to home or compete with the local possums for a den site. Hence, provision of an alternative den site by placement of a nest box in a suitable location is an appropriate part of the solution to removing possums from your roof. Other species, including Brush-tailed Phascogales, may also choose to live inside a house and may be dealt with similarly.

If you do decide to have a possum removed from your roof then you should contact a pest controller authorised by the Department of Conservation and Environment to trap possums (they are listed under 'Pest Control' in the Yellow Pages telephone directory).



Common Brushtail Possum



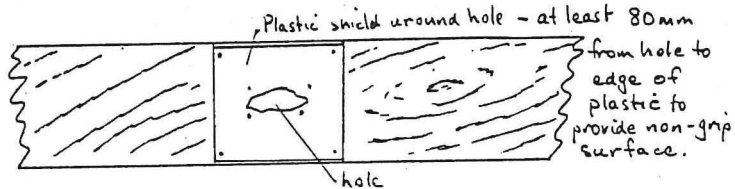
Common Ringtail Possum

Living with Bats

Bats may also frequent a house and may take up residence in the wall cavities or roof. As a protected species they may not be harmed. A simple method of removing bats from a house, with one or few manageable entrances to the roof or walls, is to place a bat exclusion flap over each entrance. Provision of alternative accommodation outside the house for bats may encourage them to stay around and keep down insect numbers. Bats are able to use extremely small entrances. Further information on how to deal with wildlife problems is available from the Wildlife Damage Control Officer, Department of Conservation and Environment, 123 Brown Street, Heidelberg, 3084; telephone (03) 450 8600.

Bat exclusion (one way) flap

Plastic flap hangs over plastic shield to prevent re-entry but allow exit from inside.



References:

- Nest Boxes for Australian Birds*, McCulloch, E. & Thomas, R., (1986) 2nd ed., Bird Observers Club of Australia, brochure.
The Yarra Book, an urban wildlife guide, MMBW.
Bat Boxes: A guide to their History, Function, Construction and Use in the Conservation of Bats, Stebbings, B. and Walsh, S., (1985), The Flora and Fauna Preservation Soc., Britain.
Build your own bat house, Heinrichs, J., (1987), reprinted in NSW Zoological Soc. Mammal Section newsletter, March 1987.
 Comments by Leigh Ahern, John Burtonclay, Lindy Lumsden, Peter Menkhorst, Jim Reside and Ian Temby.

Further reading:

- Wildlife needs natural tree hollows, *Land for Wildlife Note No. 6. Tree Hollows for Wildlife*, Fleming, A., (1986), Bird Observers Club of Australia. *Home is a Hole*, Healesville Sanctuary Education Service (contains additional size recommendations), *The Complete Book of Australian Mammals*, Strahan, R. (ed.), (1983), Angus and Robertson.

Ready made nest boxes, including bat boxes, are available from: EnvirOnest, Fadersons Road, Mandurang, 3551. Phone 054-395710 for a brochure.