

Nest Boxes and Hollow Habitat Toolkit



Introduction

We can all do our part to increase flora and fauna health in our local environment.

This resource looks at the importance of hollows (both natural and created), and explores changes in their availability over a number of years and how that has impacted our native species. We will also look at some ways we can create and improve hollow habitat.

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Why are hollows important?

Animals have three basic requirements for survival: food, water and shelter. The most important function of natural hollows is providing shelter from predators, as well as for safe breeding and nesting.

A natural hollow is a cavity found in either living or dead timber, with access to the surrounding environment. These hollows usually form in trees that are 80-120 years old, though it can take up to 200 years for some trees to grow hollows large enough to accommodate birds and other wildlife.

The number of hollows in a given area is determined by the number of trees that are from suitable hollow-forming species, and the age of those trees. This means woodlands and forests tend to have more hollows, particularly if they contain remnant trees.

You might like to find out what vegetation community existed in your local area before European settlement. Because hollows tend to naturally occur in eucalypt species, it's useful to know what the dominant overstorey species in your area was so you can determine whether planting those kind of eucalypts will likely produce the hollows that local species require.

Hollows may occur in standing or fallen trees, or limbs that have been buried or submerged in water. Some are only tiny openings a few millimetres wide, while others are gaping holes large enough for a person to enter. They also occur in all parts of the tree and at different heights. All of this means that they can support a greater diversity of native wildlife, and therefore can greatly increase biodiversity.

Over 300 native vertebrate species including birds, reptiles, possums and bats rely on hollows in some way. Invertebrates such as insects also use hollows, and in fact play an important role in their formation.

How do natural hollows form?

Natural hollows are often created when large branches break off trees, leaving an opening. But you may not know that they can also be formed by termites, beetle larvae and moth larvae, which live in trees and feed both on living wood (sapwood) and dead wood (also called heartwood). This creates small spaces in the tree, which grow over time as fungi and other insects decompose and burrow into the wood.

Hollows also develop with the aid of fire and lightning strikes, which bring the heartwood into contact with air. This causes the wood to dry out, shrink and crack. Insects and fungal spores then move into the cracks and feed on the dead wood inside, expanding the hollow even more. Then spiders, insects, small birds and marsupials can begin to move in.

None of our native vertebrates (parrots, cockatoos, gliders, owls etc.) are able to create their own hollows, but they can modify existing hollows to suit their needs.

The presence of hollows in different habitat types across Adelaide was not mapped prior to 1836. However we can be reasonably certain that there were significantly more hollows at that time, without the impacts and habitat disturbances that came with the arrival of colonists.

This is why it's important for us to assess our environment, particularly urban areas, for hollow habitat. Once we know roughly how much hollow habitat is available to the species that need it, we can identify those large trees we need to protect; as well as knowing if additional hollows are needed. If so, we can create nest boxes.



Assessing hollow habitats

If you would like to assess hollow habitat in your area, you might like to count the number of large trees in the area, and record how many of these have hollows that you can see. You may like to **use the survey table** on the following page to keep track of your results. If you are surveying a large area, it could be worth noting which particular pockets have the lowest number of natural hollows, so you can target those. You could also look at evidence of different types of animals around the area, and make a list of these, then brainstorm what other native species might use the same environment if there were more hollows.

Improving connectivity

To make sure our urban environment offers enough hollows to those creatures that need them, it's important to look at the spread of large trees. This is because hollows form in older, larger trees and if there is often a lot of space between them, hollow dwelling creatures may not be able to move easily between safe spaces.

There are some actions you can take to improve connectivity for those species. You don't need to have a big backyard at all to plant a native tree, and that one tree might just be the 'stepping stone' that a native animal needs to move between hollows. This basically means it provides connectivity between areas that are more densely vegetated.

SURVEY OF LARGE TREES

Site name: _____

Date: _____

Tree number / name if known	Native/ Exotic (N/E)	Dead/Alive (D/A)	Circumference at chest height	Number of hollows	Hollow size	Large tree? (Y/N*)
e.g. Tree 1 Red Gum	N	A	200 cm	3	b	Y

* A large tree is one that has a circumference at chest height of over 200cm

Hollow size:

- a) Greater than 10cm- suitable for larger birds and mammals
- b) Between 2 and 10cm- suitable for smaller birds, mammals and frogs
- c) Less than 2cm- suitable for reptiles, invertebrates and bugs

Think about the number and variation in sizes you have found. How many local species do you think might be supported by the hollows here?

Creating artificial hollows

To improve the health of our urban ecosystems and attract a variety of native wildlife, you might need to create artificial hollows in the form of nest boxes.

Not all creatures have the same nesting requirements, so it's important to do some research on the ideal size, shape and position of nest boxes for whichever species you want to attract. We already have a lot of lorikeets and rosellas in the Adelaide metropolitan area, so try to find out what are some of the less abundant native species in your area and install boxes suitable for them.

On the next page is a useful guide to get you started. You can also use the following references to find out more and get the most out of your efforts.

Resources and further reading

- www.environment.sa.gov.au/goodliving/posts/2019/09/benefits-of-nesting-boxes
- faunature.com.au/resources/
- www.adelaidesustainabilitycentre.org.au/backyards-4-wildlife/
- *Nest boxes for wildlife – a practical guide* by Alan and Stacey Franks
books.google.com.au/books?id=IRGtAAAACAAJ
- *The Nest-Box Book* by the Gould League
www.google.com.au/books/edition/The_Nestbox_Book/OF6OLAAACAAJ?hl=en#spf=1629353585039



Habitat Tree - Hollow Dimensions

Hollow Type	Orientation *	Height (cm)	Width (cm)	Depth (cm)	Entrance Hole (cm)	Above Ground (m)	Wildlife Species
Pardalotes	-	10	13	10	3	1+	Pardalotes
Grey Shrike-thrush	-	25	18	18	9x9	2+	Grey Shrike-thrush
Bats	V	30	15	15	1.2-1.5	4+	OR Bat shields
Small Mammals & Birds	V	30	15	15	3	1.5-5	Pygmy Possums/Feathertail Glider
Medium Mammals & Birds	V/H	50	15	15	4.5/6/8	4+	Small Parrots/Treecreeper/Owlet-nightjars
	V/H	55	20	20	7	4+	Medium Parrots
	V/H	45	20	20	8/4/4.5	4+	Small Possum/Sugar/Squirrel Glider
Brushtail Possum	V/H	45	30	25	10	4+	Brushtail Possum
Small Ducks	H	45	35	35	10/15	2+	Small Ducks
Kookaburra	H	30	30	50	12x18	4+	Kookaburra
Barn Owl	H	40	40	90	25x15	6+	Barn Owl
Cockatoos	V	100	40	30	18	10+	Cockatoos

Additional information

☐ Bees: will potentially invade hollows of this size. Other invasive species (e.g. Indian Mynas & Starlings) may also invade any mid size boxes.

- The *Hollow Types* in bold cover many of the more common species and are recommended as good hollows to start on.
- Created hollows in habitat trees require inspection and maintenance, as does any artificial nesting/roosting site.

* H = horizontal & V = vertical.

N.B. The above species list and associated measurements are an initial guide to the dimensions, required by a range of hollow dependent wildlife found in Victoria. This *Habitat Tree - Hollow Dimensions* is a “work in progress” and over time this resource will be expanded and enhance. Feel free to forward any reliable data or feedback which may be of assistance, so this resource can be up dated.

Placement of nest boxes

Nest boxes are a great way to increase available hollow habitat when needed; however they do lack a few of the features of naturally occurring hollows. In particular, they are much less insulated than natural hollows, so they need to be physically protected by shading tree trunks and canopy cover to ensure they don't overheat or become too cold.

There are also different types of nest boxes for different species, and the location of them will depend on which species you are targeting. There is a useful diagram on the following page showing the ideal aspect for different types of nest boxes. For example, for a micro bat nest box the entrance should face north-west, while birds and mammals prefer an easterly aspect.

It is also good to know the following general tips:

- Most species do not nest too close to the ground, so between four and six metres high is ideal for a nest box. Make sure when installing the box to do so safely, using a ladder or scaffold that is stable and always working with another person. You might also like to look into hiring a professional to install the box for you.
- Position the nest box close to other vegetation, as animals are more likely to use it when they have the protection of other trees and shrubs nearby.
- The entrance of the box should face away from the wettest winds, so avoid south-west to westerly aspects.
- If possible, place the box on a vertical or slightly forward angled tree trunk. This will help prevent rainwater from entering the box.
- Try to place your nest box away from tree forks, to lessen the risk of attack from cats and foxes
- You need a mature native tree with a trunk no less than 25 centimetres in diameter, and a good canopy. As mentioned above, anything smaller can result in irregular temperatures inside the nest box.
- Secure the box using wires around the tree, and if possible incorporate a spring so the growth of the tree won't be inhibited.
- Alternatively, put a hardwood batten on the back of the bird box that protrudes above and below the box. Pre-drill a hole at the top of the batten, and secure at the bottom using screws. It is crucial that the box is securely fastened, due to the risk of injury or damage by fallen nest boxes.

You may like to use this checklist as a guide when deciding where to install your nest boxes.

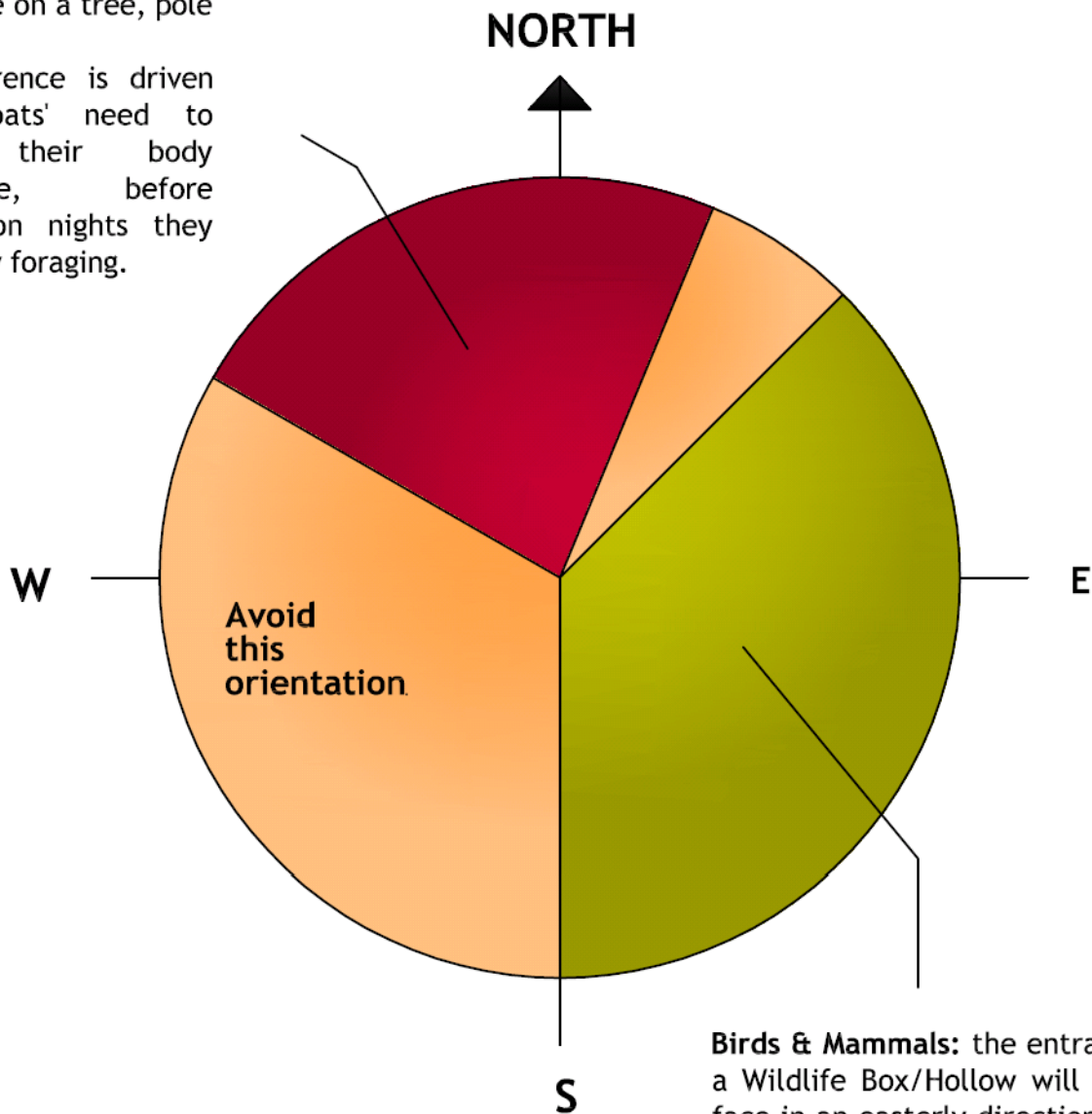
- Safe and secure location (away from predators)
- Sheltered from extreme weather
- Easily accessible
- Temperature regulated

Please note: Your backyard is the best place to put a nest box. Do not install nest boxes in local parks, unless you have permission from the local council or are involved in a program through Green Adelaide or a similar organisation. This is because they need to be regularly maintained. They also may attract the wrong species, such as European bees, and could present a hazard to other park users.

Recommended Orientations for installing a Wildlife Box/Hollow

Micro-bats: prefer a north to north-westerly aspect. This may be on a tree, pole or building.

This preference is driven by the bats' need to increase their body temperature, before emerging on nights they are actively foraging.



Birds & Mammals: the entrance of a Wildlife Box/Hollow will ideally face in an easterly direction. This may range from north-east to due south.

This orientation allows for the hot north/west sun and the prevailing south-westerly rain to be avoided. Ideally the box/hollow will be sheltered by the tree canopy and trunk during the hottest part of the day.

Parrots and other hollow nesting birds tend to prefer an open aspect. Mammals such as possums and gliders, however, prefer a more closed or sheltered aspect (e.g. dense overhanging foliage).

N.B.: Across southern Australia the prevailing weather/rain systems tend to come from the south and west. This may differ in other parts of the country. Therefore when orienting a wildlife box/hollow (entrance) in other locations, this needs to be borne in mind.

Monitoring your nest box

It is important to monitor nest boxes once they are installed, so you know which species are using them and how valuable they are. Comparing survey results before, during and after installation can show you not only what species we have in the area, but whether you need to change the location of boxes to better suit those species.

Please note that it often takes some time for fauna to start using nest boxes- sometimes between six to twelve months following installation, although it can be sooner. This is why it's a good idea to regularly check the boxes, and track approximately when native fauna are moving into them.

There are a number of monitoring methods you can try. You might like to use the record sheet on the following page to keep track of your findings over time.

- Be careful not to disturb animals or get too close to the nest boxes when surveying, as they may have young in the boxes
- Allow about one minute for each nest box in the survey area, and note any bird species seen in the area.
- Note whether the birds seem interested in any of the boxes
- Quietly walk around the survey site and check each box for damage or obvious signs of use
- Stand still below the box and listen for noises such as scratching or animal calls
- If possible, check for signs of use such as scratch marks, fur or feathers around the edges of the box
- Check the ground for droppings
- You might like to use nest box cameras to monitor which animals are using the box; however these should be used sparingly because they can disturb the wildlife inside.

Nest box maintenance tips

Nest boxes do wear out over time due to exposure to sun, heat and wind; as well as modification by the animals that use it. Be sure to regularly check any nest boxes you have installed.

Once a year, the following maintenance should be carried out (but do make sure the nest box is not in use at the time- try to avoid winter and spring if possible due to lots of animals breeding during this time):

- Check it is still securely attached to its tree, and tighten fixtures if necessary.
- Treat the exterior with boiling water or natural oils- sometimes the nest box provider will do this for a fee.
- Remove old nesting materials.
- Check for pest species, such as European bees or starlings, and remove any boxes that have signs of use by them.

Occasionally boxes can be damaged by pests, or animals which are too large to comfortably fit through the entrance. If you notice this kind of damage at any stage, it should be fixed as soon as possible.

