Building nest boxes after fire

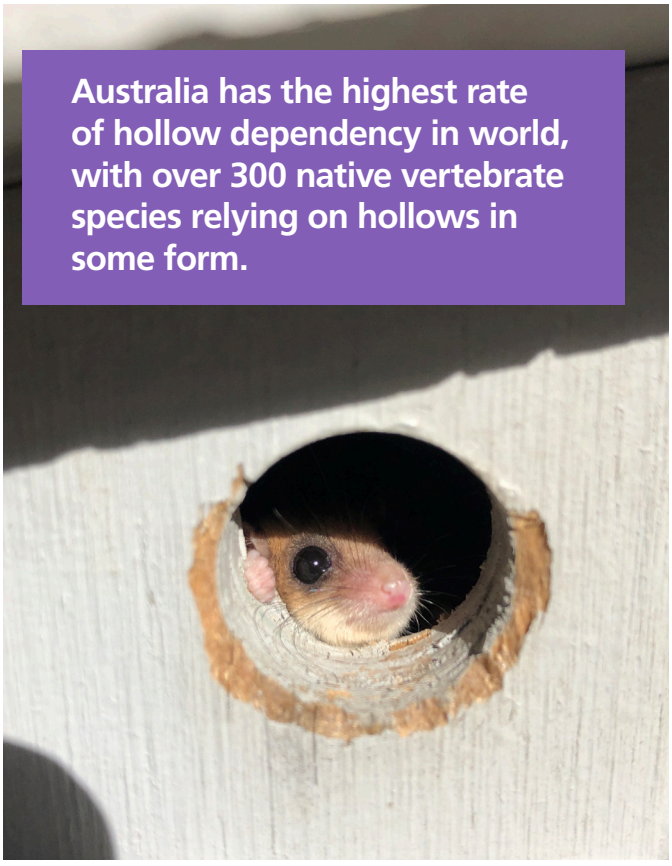
Fact sheet | March 2020

Bushfires can cause the short term loss of habitat for some native fauna species, including those that rely on tree hollows. If trees with hollows are lost from your area, nest boxes can be a great short to medium term option to help provide these essential resources. The trick is to know which species you need to focus on for a particular site, and what kind of nest box is suitable.

The importance of hollow-bearing trees

Natural tree hollows are extremely valuable for many native wildlife species and essential for the long-term viability of many wildlife populations. They provide roosting and breeding sites, offering shelter and protection from the elements and predators.

Approximately 30% of Australia's terrestrial mammals, 60% of micro-bat species and 15% of bird species depend on hollows for roosting, nesting or food. Some species (e.g. brown treecreeper, laughing kookaburra) need hollows to continue to persist in the landscape. Others, such as pygmy possums will seek out hollows but can use alternate shelter if hollows are not available.



Australia has the highest rate of hollow dependency in world, with over 300 native vertebrate species relying on hollows in some form.

A western pygmy possum (Concinnus cercartetus) *peers out from its nest box* *Photo Elisa Sparrow*

*A yellow-tailed black cockatoo nesting tree (*Eucalyptus dalrympleana*) collapsed after the Cudlee Creek fire, 2019* *Photo Kieran Brewer*

Natural hollows range from small cracks, just a few millimetres wide, to large ones which may be 50 cm or more wide, and several metres deep. Hollows can occur in the trunk, limbs or stumps, and entrances can be at any height. Cavity dependant wildlife rely primarily on Eucalyptus species and these trees provide essential habitat when alive, but dead standing stags are just as important.

Hollows can take 100s of years to develop, and we are losing them faster than they are being replaced. Fire can be a benefit and detriment to hollow bearing trees; it can assist in the creation of hollows, however trees that already have hollows are more susceptible to collapse after a fire.

The role of nest boxes

Artificial habitat for hollow-reliant wildlife can be created by installing nest boxes that mimic the shape and size of natural hollows. However, nest boxes are not a true substitute for these hollows, so it is vital to protect trees that have them, including dead, standing trees and fallen timber. Consideration for those trees that will form the next generation of hollows is also essential. There is still a lot to learn about nest boxes and how they might contribute to conservation after fire, especially as resources like food may also be limited, so location will be important.

If you want to provide artificial hollows on your property after a fire, it is important you do some research first. Here is some information to help you get the best results.

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Nest box tips

Maintenance

Nest boxes require maintenance, they are not just a "set and forget" project. They need to be checked at least a few times a year for use by feral animals (e.g. European honey bees, European starlings and common mynahs), fastening screws and/or chains changed, and the general integrity of the structure examined. This is not always an easy task given the height of the boxes.

Fire impact on hollow-bearing trees

Look around your property and think about what type of species were there before the fire and how the fire impacted on their habitat trees. Is there a need to provide artificial hollows? For example, if you have yellow-tailed black cockatoos nesting in trees, are the trees still there or have they collapsed?

Smaller species like pardalotes, yellow-footed antechinus and microbats rely on hollows with a small entrance to protect them from predators. Do the hollows suit these small species or have the entrances been enlarged due to fire?

Target species

Each species has different nest box requirements such as height, width and depth. One important consideration is the size of the entrance hole. The hole needs to be just large enough for the animal to enter, but small enough to exclude bigger animals which may predate on the occupants, or be more dominant. Boxes for some species may require features such as drainage to avoid drowning, sacrificial chewing posts, and ladders for exit and entry. Investigate the requirements for your target species first. The table below, adapted from Faunature, is a good guide for the approximate dimensions required for various species.

The addition of most well-constructed nesting boxes will be beneficial. Common species are likely to be the quickest to take up residence in these new homes. Threatened species may take longer, however supporting this rare wildlife is particularly rewarding, and of greatest benefit to the environment. When deciding what species to target, also consider those that may be "undesirable" in certain settings. For example, if vineyards or orchards are nearby, try and avoid attracting fruit eating species. Instead you could choose to attract insectivorous or carnivorous species like pardalotes, kookaburras, owls or nightjars. This may be especially important after a fire, as recovering crops are already under pressure.

Nest box requirements for native species

Wildlife species	Orientation	Height (cm)	Depth (cm)	Entrance hole (cm)	Above ground (m)
Pardalotes **Tree martin**	-	10	10	3	1+
Grey shrike-thrush	-	25	18	9x9	2+
Microbats	Vertical	30	15	1.2 – 1.5	4+
Pygmy possums **Yellow-footed antechinus**	Vertical	30	15	2 3	1.5 – 5
Small parrots **Tree creepers** **Owlet nightjars**	Either	50	15	4.5 6 8	4+
Medium parrots	Either	55	20	7	4+
Brushtail and ringtail possums	Either	45	25	10	4+
Small ducks	Horizontal	45	35	10 – 15	2+
Kookaburra	Horizontal	30	30	12 x 18	4+
Barn owl	Horizontal	40	40	22 x 15	6+
Cockatoos*	Vertical	100	40	18	10+

*Yellow-tailed black cockatoos prefer a different type of design, similar to Carnaby's cockatoos www.dpaw.wa.gov.au/images/plants-animals/threatened-species/carnabys_artificial_hollows_-_design_and_place_2015.pdf

Box design

Nest boxes can be purchased from State Flora (Belair and Murray Bridge), Cleland Wildlife Park and Faunature.

www.faunature.com.au

Or make your own. Do your research first though, to ensure you are building boxes to attract the species you want. Consider the entrance hole size, species requirements and more, as discussed earlier. There are many resources online, including:

https://nestboxtales.com

https://nestboxtales.com/wp-content/uploads/2020/02/NestBoxPack-AdelaideHills-BushfireZone.pdf

www.birdsinbackyards.net/Nest-Box-Plans

www.backyardbuddies.org.au/habitats/build-a-microbat-roost-box

www.wildlifevictoria.org.au/images/How_to_Build_a_Possum_Nest_Box.pdf

Placement of boxes

Correct placement of the boxes will increase your chances of success, so understanding the habitat preferences and behaviour of the species you are trying to attract will be important. For example, microbats need at least 3 m of clear space below the box entrance (e.g. no large tree limbs or shrubs) so they can fly into the box.

Other points to consider:

Food availability: after a fire, food is limited, and it may take years for severely burnt trees to flower again. Consider placing nest boxes in locations where trees are less impacted e.g. in/near an unburnt patch of vegetation, or where the canopy is still intact. Putting boxes in/near these intact areas will also help provide protection from the weather (e.g. sun, rain). This is especially important for species like yellow-tailed black cockatoos where the top of the nest box may be open.

Tree selection: attach the box to a tree species that would normally be used, avoiding significantly damaged trees which may not support the box in the long term.

Height: distance from the ground varies (see the table in this fact sheet). The box needs to be high enough to avoid predation from cats, rats and foxes but low enough to allow access for maintenance.

Angles: install boxes vertically or on a slightly angled forward trunk to reduce rainwater entry.

Installation: some of the large boxes will potentially need someone with qualifications in tree climbing (e.g. arborist) to install. Again, take care to avoid trees that may be structurally damaged.

Orientation: this may differ in each location and with the species you want to attract. For most species you will be looking to avoid the hot north and westerly sun, together with the wet south to south-westerly winds. Birds and most mammals prefer a box facing in an easterly direction, however depending on the tree it can be oriented from south to northeast. In contrast, microbats prefer a north to north-westerly aspect as the heat from the afternoon sun will help raise the bat's body temperature in preparation for night-time flight.

*A yellow-footed antechinus (*Antechinus flavipes*) explores a nest box (above) and makes a nest inside a box (top)* *Photos Elisa Sparrow*

Patience

Wait and observe. Patience is important with nest boxes, especially after a fire. Food resources are limited and will influence what species return and when. The box may remain unoccupied for a few years, however once found many species will continue to use the same hollow for consecutive years.

Handling wildlife

Please do not handle or disturb wildlife. The boxes are there to protect them, even from those of us who are well meaning. If you have to perform maintenance, wait until the inhabitants have left the box.

There is plenty of information online if you want to learn more. However, if you have a specific question please contact your local natural resources centre.

*A striated pardalote (*Pardalotus striatus*) is a small insectivorous bird that nests in hollows*
Photo Martin Stokes

References

Franks, A and Franks, S (2006) Nest boxes for wildlife: *A practical guide*. Bloomings Books.

Gibbons, P & Lindenmayer, D (2002) *Trees hollows and wildlife conservation in Australia*. CSIRO Publishing, Collingwood, Victoria.

www.ari.vic.gov.au/research/people-and-nature/use-of-nest-boxes-in-victoria

www.faunature.com.au

Further information, contact your local Natural Resources Centre:

Gawler (08) 8115 4600

Black Hill (08) 8336 0901

Willunga (08) 8550 3400

Mount Barker (08) 8391 7500

www.naturalresources.sa.gov.au/adelaidemtloftyranges

www.naturalresources.sa.gov.au/samurraydarlingbasin

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