The Re-Cyc-Ology Project

From Waste to Wildlife Habitat

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Build your own nest-box for wildlife.

Building your own nest-box is a fun, easy, hands-on educational activity that can help attract wildlife to your own backyard or local bush area, and make you feel good about contributing to sustainability. All you need is a little time and some basic wood-working tools. The Re-Cyc-Ology Project's ethos is that all nest-boxes can be constructed from waste materials. This makes the activity very cheap (even free!) and also helps the environment by minimising landfill.

About twenty per cent of Australian animals need hollows to meet their roosting and/or breeding requirements, so it is important that if a box is made, it has the strongest possible chance of serving its purpose to assist native wildlife. Nest-boxes are best suited to backyards, or bush reserves with young trees that have no natural hollows. They are not necessary in bushland that already has old, hollow-bearing trees. Remember to seek permission from land-managers before you install any boxes.

'Traditional' nest-box designs originated in Europe as a simple plywood box with an entrance hole. This form of box will still attract wildlife in Australia, but it is unlikely to last more than a year (sometimes even less) and has a strong chance of becoming occupied by unwanted species (especially feral bees), and therefore not fulfilling its aim to help wildlife! This is because our hollow-dependant fauna are different to those found on other continents. Simon built his first (very basic!) nest-box in 1994, then learned through years of practical experience that incorporating a number of key design features will increase the box's longevity and maximise the chance of uptake by target fauna.

This fact sheet is designed to provide anyone (especially those people who have attended a Re-Cyc-Ology workshop!) how to construct a good quality, long-lasting nest-box. More detailed information can be accessed in a number of excellent books and websites (some are mentioned below). Check the images on the Re-Cyc-Ology website for images of properly installed nest-boxes.

IMPORTANT DESIGN FEATURES

- **Construction material:** Form-ply (18mm thick) is a laminated plywood that is excellent for nest box construction because it is waterproof, long-lasting and easy to work with. Most modern construction projects use this wood so it is a common waste material. Special glue used to make the wood waterproof may contain toxins but don't worry: most fauna come and go from nest-boxes without risk of ingesting any material! Even species that chew the box do not normally swallow any fragments they break off. In over 10 years of box construction and monitoring we have found no evidence of occupant fauna being harmed. Other plywood or hardwood planks can also be used.

- **Ladder:** Most timber used for nest-box construction is smooth, unlike natural tree-hollows which have a rough surface. Animals will therefore need a ladder on the inside

of the box to provide access from the entrance to the floor (or just above). Ladders can be made from wire mesh/grill; stiff mesh is best as it sits flat on the wood (ensure there are no sharp ends). You can also make a wooden ladder by cutting grooves into another piece of wood and fixing it to the insides, or cutting grooves on the inside of the box itself, but this should only be used in backyard nest-boxes that will be monitored regularly. Wooden ladders have a shorter lifespan as parrots will eventually chew them to pieces. Sadly, we have found the wooden ladders used inside some PVC nest-boxes to be quickly destroyed by galahs, resulting in the boxes trapping and killing dozens of birds that entered the box and could not climb back out. **Ensure the ladder you make caters for non-target species.** We have recorded broods of dead ducklings inside PVC cockatoo boxes fitted with thin ladders made of coarse mesh that is too large to allow species smaller than cockatoos to climb out.

- **Drainage holes:** Although boxes are usually weather-poof, some moisture may still enter (particularly in stormy weather), so it is important that drainage holes are drilled in the base of the box to stop it getting waterlogged. Four to six holes 8-10mm in diameter are all that is required.

- **Natural hollow entrances:** The main purpose of a natural timber log-round on the front is to restrict the entrance diameter to the target species' size, and provide a hardwood surface for heavy chewers (mainly parrots) to gnaw on so they don't chew the plywood. Some species (especially galahs) will try to enlarge the entrance hole on boxes they are unable to fit into, and this will result in boxes being badly damaged or even totally destroyed. Log-rounds also help keep rain out, and make the box look more like a natural tree-hollow which will increase the chance of native fauna taking up residence. It is imperative that tree-hollows are **not removed from natural bush** as they are already providing habitat for terrestrial wildlife.

- **Paint:** Painting boxes is important to make external surfaces (especially the cut edges of form ply) weather-proof, and increase their aesthetic value. Using natural bush colours will help the box blend in with its surroundings. We obtain second-hand paint of almost any colour and (if necessary) have it tinted to be either green, grey or brown. Paint should be water-based as spirit-based paint emits odours that may harm wildlife.

- **Woodchips:** A layer of woodchips, and bark and/or leaves approximately 100mm deep (200mm for Black-cockatoo boxes) should be placed inside nest-boxes to line the floor and provide occupant fauna with a suitable substrate on which to nest. It also gives nesting parrot species something to chew, preventing them from gnawing the inside of the box. Coarse woodchips made of natural timber are best because they are well drained. Sawdust should not be used as this is too fine, will absorb water and may attract ants.

- **Mounting block:** A wooden block on the back or side of the nest-box (depending on box's orientation to the tree) helps prop it firmly against the tree trunk and allows it to hang firmly in a vertical position.

NEST BOX DIMENSIONS

The following table has been adapted from the one shown in the book 'Nest Boxes for Wildlife: A Practical Guide' by Alan and Stacey Franks (Blooming Books, 2006), using our experience of Western Australian wildlife. Sizes quoted are a guide only – these can be varied by 10-20mm to suit the dimensions of existing materials and reduce waste.

Table 1: Minimum box requirements for different species. ID = Internal Dimensions; DC = Depth of chamber from bottom of entrance hole; ED = Entrance Diameter; MH = Minimum Height above ground.

Species	ID (mm)	DC (mm)	ED (mm)	MH (m)	Comments
Australian Owlet-nightjar	150 x 150	300	65	4	Short horizontal spout entrance for sunning
Black Cockatoo	300 x 400	900 - 1200	Open top.	10+	Requires sacrificial hardwood chew posts fixed to the entrance and inside

Parrot or Rosella	150 x 200	400	See comments	4-6	Western Rosella, 55mm Red-capped Parrot, 65mm Australian Ringneck, 75mm
Ducks	250 x 300	100	150	1-3	Near water
Australian Wood Duck	250 x 300	100	150	5-10	Short horizontal spout entrance
Kingfisher	150 x 150	30	50	4-6	Horizontal spout entrance
Owl	300 x 300	200	150	6-10	Short horizontal spout entrance
Pardalote	120 x 150	300	30	3-6	Fill chamber with woodchips
Purple-crowned Lorikeet	150 x 150	400	65	6-10	
Treecreeper	150 x 150	350	60	4-6	
Possum	250 x 250	300	100	2-6	Will use several den sites
Mardo (Antechinus)	150 x 150	200	30	2-4	Rear entrance
Brush-tailed Phascogale	150 x 150	300	40	3-6	Rear entrance

* Galahs and some species of Corella are not native to parts of south-west Western Australia and should not be encouraged. See below for detail on Galahs.

PROBLEMS YOU MAY ENCOUNTER

Bees: Feral Honey Bees (*Apis melifera*) are an unwanted inhabitant of nest boxes and one that can be quick to invade. Many people do not realise that bees are introduced to Australia, and despite being in decline in other countries, are a pest in Australian environments and a key threat to our native wildlife, especially Black Cockatoos. Bees often take over entire tree-hollows, killing native animals in the process and preventing the hollow from being used again. Creating air-slots under the lid of nest-boxes will reduce the chance of bees invading by about 80% – this is because they require an optimum internal temperature (about 32˚C) and are deterred by fluctuations caused by air flow. It is important that air slots extend down the length of each side, and do not become blocked. They do not need to be more than 15-20 mm wide. If bees do invade a nest-box, they can be killed using petrol or citronella oil, applied at night when the colony is asleep. If in doubt, phone a local apiarist who can remove the hive safely.

Parrots and chewing: Parrots and cockatoos like to chew everything! This is a perfectly natural and unavoidable behaviour, but it can be damaging to your nest-box and reduce its life-span. To prevent chewing damage, reinforce the edges of the lid and the external surfaces of each air slot with metal (e.g. aluminium angle). This can be fitted to the box as shown in Steps 1-4 below. You may even wish to build the entire lid from metal, which is the best type of reinforcing you can give it! Metal lids can be fixed with two screws, one in each corner, still allowing the box to be opened by loosening one screw and pivoting the lid sideways. Don't forget to round off sharp metal corners with a file or grinder.

Galahs: Galahs (*Eolophus roseicapillus*) are especially destructive and will try to chew their way into boxes if the entrance is too small. They will also ringbark the nest tree, leading to increased stress and eventually death. Reinforcing your box as outlined above will help stop Galahs from being able to totally destroy it.

Although a native Australian bird, the Galah has expanded its range and increased its population size enormously since European settlement. Galahs were predominantly a desert-dwelling cockatoo, but following clearing of the West Australian Wheatbelt region and provision of permanent water, it expanded its breeding distribution into the south-west and continues to displace local native fauna and impact tree health. To read more about Galahs and why they shouldn't be encouraged, read the following post on Simon's blog: http://simoncherriman.blogspot.com.au/2013/07/galahs-changing-places.html

Step 1

Step 2

Step 3

Step 4

INSTALLATION:

Once you've fitted the metal reinforcing, your box is ready to go! It should be hung in a tree in your backyard where you can get a good view and keep an eye on it. The selected site should not be too open or close to busy parts of your house: a quiet spot where you've seen birds perching before is ideal. Appropriate heights for various boxes are outlined in the above table – these are important to maximise the chance of your box being used, and to prevent access by unwanted predators (i.e. cats). Monitoring is also easier if the box is accessible with a ladder. Boxes are best oriented to face away from prevailing weather, but suitability of the tree branch is the main factor which influences where your box should go. Many natural hollows selected by nesting or roosting fauna face the rain and this doesn't seem to bother them!

The box should be hung using a length of wire – multi-strand clothesline wire is best, or anything that is flexible (avoid high-tension wire). Remember, recycled is best, so see if you can get some second-hand wire from a scrap yard or rubbish bin. Old hosepipe should also be used to thread the wire through and protect the tree. Here's how to set the wire up:

1. After selecting the spot for your box, measure a length of hosepipe approximately long enough to go round the trunk of the tree, and cut it to length. Then use this to measure the wire, which should be double the length of the hose.

2. Make a loop in one end of the wire by twisting – pliers help! (Step 1).

3. Push the free end of the wire through one of the pre-drilled holes in the back of the box, and reaching inside, pull it entirely through until the loop is hard up against the box (Step 2).

4. Inside the box, now push the loose end of the wire out through the second pre-drilled hole on the other side of the box, and again pull it tight (Step 3).

5. Thread the loose end through the hosepipe until it emerges from the other end, making sure it will cover the entire piece of wire that touches the tree (Step 4).

6. Getting someone to hold your ladder, set the box in position then pass the wire around the back of the tree. It is a good idea to rest the box on a branch. Having another branch on the opposite side of the tree to the box is really helpful to pass the wire over – this stops the box sliding down the tree.

Step 1

Step 2

Step 3

Step 3

MONITORING AND MAINTENANCE

Now you've made and installed your nest-box, it's time to take ownership and keep an eye on it! Nest-boxes work best when they are regularly monitored and maintained, and if you have followed the tips outlined above, most will last many years, but keeping an eye on them and undertaking any maintenance will ensure an even longer life.

Monitoring nest-boxes is part of the fun – this can be done by simply keeping a diary with ongoing records of fauna seen inspecting or entering your box. It is interesting to identify which species are seen prospecting boxes at different times of year and which may end up using them. Is a possum sleeping in there during the day, or a parrot nesting there during the breeding season!? Information gained from monitoring is useful for several reasons: to further refine their design features; for determining suitable locations for more boxes; to help gather important data on species that may be benefiting from nest boxes; and to determine which pest species might pose a threat to your local native wildlife. Remember, it may take a little while for animals to find nest-boxes so be patient! Keeping records of different species using your nest-box and learning about their behaviour is a wonderful way to engage with and take ownership of your local environment. It is a huge step towards understanding and appreciating our amazing natural world!

RESOURCES

Franks, A. and Franks, S (2006). 'Nest Boxes for Wildlife: A Practical Guide'. Blooming Books, Melbourne, Australia.

Adams, G. M. (2011). 'Birdscaping Your Garden.' D & G Publishing.

The Re-Cyc-Ology Project website: www.re-cyc-ology.com.au

'iNSiGHT News' blog posts relating to nest-boxes:
http://simoncherriman.blogspot.com.au/search?q=nest+box