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Build your own Wildlife Nest Box.

A guide for Western Sydney

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Build your own Wildlife Nest Box: A guide for Western Sydney

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About GS LLS

Greater Sydney Local Land Services (GS LLS) is a State Government agency delivering quality, customer-focused services to farmers, landholders and the community in Greater Sydney.

LLS bring together agricultural production advice, biosecurity, natural resource management and emergency management into a single organisation.

Purpose of this guide

This guide was developed to complement the Greater Sydney Local Land Services (GS LLS) Hollows for Habitat forum in May 2015. This forum brought together over 200 natural resource practitioners from the region to improve the protection and restoration of hollows for wildlife habitat.

A number of nest box construction guides are commercially available. However these guides focus on common species not those which need it most. These boxes are often of low quality and it is common to find boxes falling off trees just a few years after installation.

This guide was developed to encourage community to build boxes for the species which most need it and ensure quality construction which will provide homes for wildlife for years to come.

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Building, installing and monitoring nest boxes are inherently dangerous activities. Participants should be suitably experienced and undertake any activities in an appropriate and safe manner. Local Land Services does not accept liability for any loss, damage or injury which may occur as a result of these activities.

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Introduction

Why nest boxes?

Most of our wildlife needs tree hollows for shelter but trees can take 100 or more years to develop hollows. Where natural hollows are limited you can help your local wildlife by installing nest boxes.

Not all wildlife needs a helping hand! Avoid helping large and abundant species like Brushtail Possums and Cockatoos which push out smaller/ rarer wildlife. Instead try a box for Sugar Gliders, Red-rumped Parrots or Antechinus.

Choosing your species

Before you start you need tro choose which animals you will build boxes for. Widlife can be very fussy so you need the correct design and dimesnions to attract your target species. Not all wildlife needs a helping hand!

Which wood to use?

Choosing the best wood will give your box good insulation or 'thermal mass'. Common materials in decreasing suitability include:

- Hardwood Is best, preferably >15 mm thick – e.g. mill offcut 'rounds'
- Marine Ply will last a few years. It needs to be thicker – at least >17 mm thick
- Exterior Ply is least durable and warm and should be >17 mm thick.

Large and abundant species like Bushtail Possums and Sulfur-crested Cockatoos push out smaller / rarer wildlife. It is better to try a box for Sugar Gliders, Red-rumped Parrots or Antechinus. This guide only provides designs for less common species that need our help.

How many to build?

Most animals use multiple hollows and regularly change hollows. This helps keep their hollows clean and free of parasites or disease. It also helps them avoid predators such as Owls which quickly learn which hollows are in use. Because they rotate homes we need to provide multiple nest boxes to support each individual animal. As a rule of thumb it's good to provide at least four nest boxes for each individual you want to assist.

Selecting Materials

Strong, warm materials are essential for successful nest boxes and there are no cheap short-cuts.

Natural tree hollows provide excellent insulation against the cold/heat and last for a very long time. Warm and tough materials are critical for your nest box to be effective.

Pine, interior ply and any materials under 15 mm thickness are not suitable. These materials won't last more than 5 years outside and don't provide enough thermal insulation for wildlife.

Installation

Choosing a tree

Make sure you select a location away from disturbance and street lights which may spook wildlife.

Box orientation is less important in Sydney than in other regions. However facing generally north and using a variety of orientations with your boxes can ensure wildlife have a good selection of sites.

Installing your box

The easiest way to install your box is with an extension ladder. Make sure you are safe at all times and the ladder is secure as installing the box can be tricky.

Most animals will use boxes between 3 – 4 m high. Remember that you will want to access your box later to clean it or to check it so make sure it is reasonably accessible.

Spring-wire attachments are popular but over time these strangle the tree or loosen and let the box sag. Instead arborists recommend drilling boxes directly into trees using two coach screws spaced vertically. This is safest for the tree and box.

Make sure your screws are long enough (3 inches) to get through the tree bark into the heartwood. You can coat your screws with organic oil (e.g. Tung or Linseed Oil) to sterilise them before use.

Cut two thin strips of PVC pipe ('spacers') to sit over the screws between the box and the tree. This allows the tree to shed its bark and by setting the box off the tree surface it avoids rot getting into the box.

Screwing bolts or coach screws into a tree is hard work. Always drill a pilot hole first. If your drill struggles to screw the bolts try using an impact driver instead.

Do I need to clean my box?

No. Most wildlife keep their nests clean. A few species (for example Antechinus) can soil their boxes however this is not cause for concern – that's how they live. Cleaning your boxes can cause the animals to desert the box. A few small holes in the base of the box can help keep them dry and avoid rot setting in.

What if I get feral bees?

The larger nest boxes can sometimes be taken over by feral bees, even evicting the mammals nesting there. While this is distressing to watch recent research found that bees move out by themselves and don't have a long-term impact on nest box use. As long as you have a few boxes to give the natives a choice you don't need to worry about feral bees.

Monitoring your box

It can take a while before wildlife get comfortable with the nest boxes and move in so don't expect results overnight.

Also remember that wildlife move between hollows (and nest boxes) on a regular basis so some of the boxes will be vacant at any given time. You will often find signs that your box has been used (feathers, scats or nest material) even though an animal isn't at home.

It's a good idea to check up on your boxes every 6 months or so. Scratches on the entrance are a good sign that someone is home.

Folding lids are the easiest way to check boxes. However these do add to the cost and weaken the box.

If you don't like folding lids you can check on your boxes by installing an automated wildlife camera on a nearby tree. This will check what comes in and out of the box.

Another trick is to nail a light piece of string or cord hanging over the entrance hole. Animals entering the box will push the end of the string in with them so you can know if someone is at home (although animals will often bite the string off).

Much of our wildlife is shy so you may well have someone living in your box without ever seeing them.

WebCams for nest boxes

Many people like to install a camera in their nest box to watch what happens inside. Nest-box camera kits lit with InfraRed lights are readily available for about $150 (e.g. www.nestbox.co.uk/Eco-Camera-Kit-K1.html). There are two key considerations if you want to install a nest cam:

1. Prepare for a camera before you install the box. Once a box is occupied it's difficult to install a camera without evicting its tenant. You can't know which boxes will be used in advance. So prepare each box before installation by drilling a small hole in the upper side to accommodate the power lead of a camera. You can then quickly Velcro a camera in if/when that box is used.
2. You will need a computer (or smart phone) near the box to record or transmit the photos. The cheapest and easiest method is to use a nest box close to a house or shed with a computer.

Sugar/Squirrel Glider

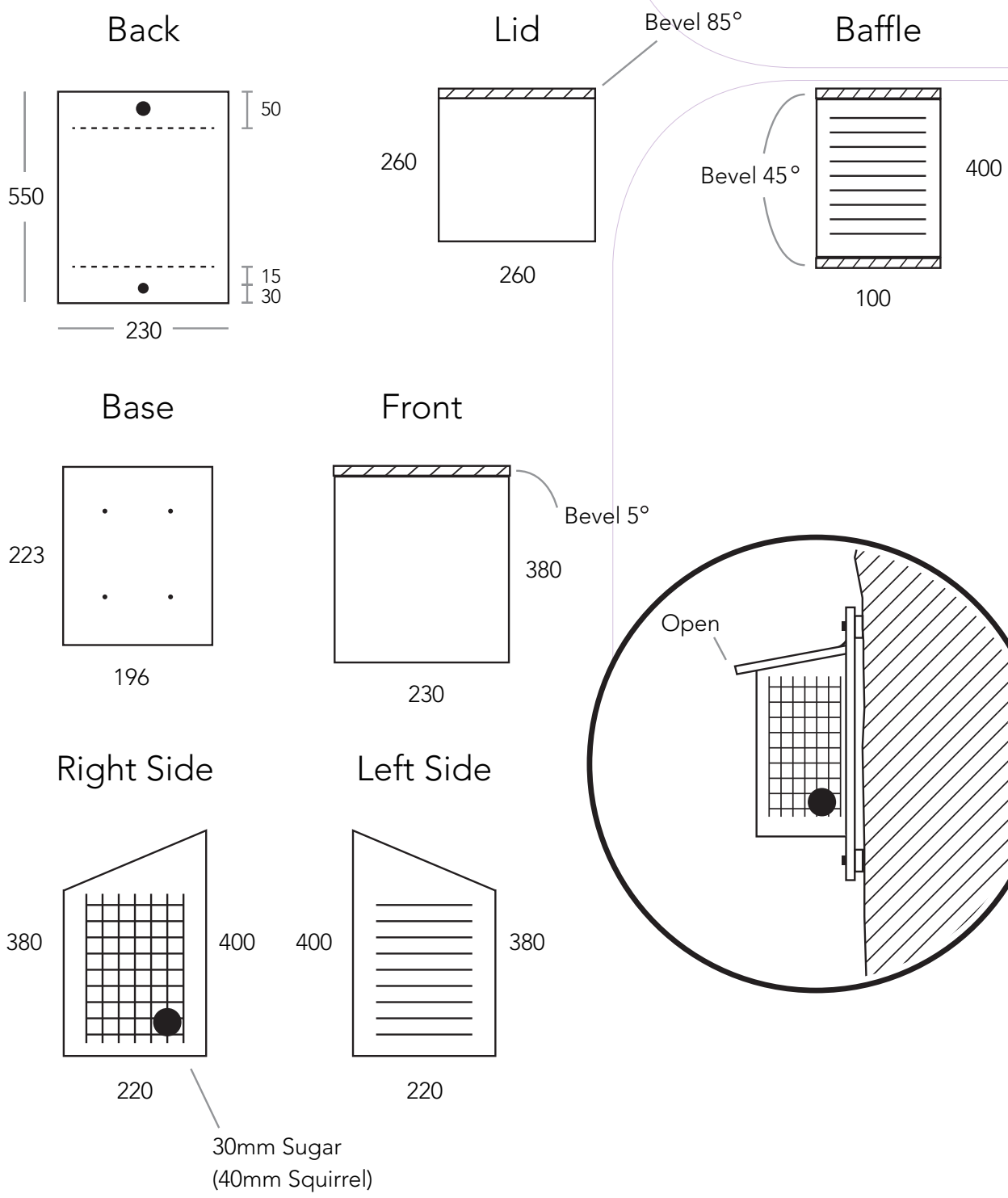
Sugar & Squirrel Gliders are small possums which spend their life in the tree tops. They have special membranes between their front and rear legs which allow them to glide up to 50 metres from tree to tree.

These gliders mostly feed on insects and nectar. In Winter they also use their strong teeth to cut into the bark of bloodwoods and wattle trees exposing the sweet sap which they eat. Family groups will visit the same trees each night and maintain these sap lines until better food becomes available.

Gliders typically live in small family groups of 2 to 10 in tree hollows. They need a relatively large nest box so they can all fit in together but with a small entrance hole to protect them against the larger cockatoos and Brushtail possums taking over their boxes.

Sugar Gliders are found in small numbers in most bushland areas. The related Squirrel Glider is a slightly larger glider generally found in more open bushland and is an endangered species.

Sugar Glider (17mm ply)



Attachment with PVC Pipe 'spacer'

Materials

Material	Quantity (per box)
Timber	3 m length, 200 mm wide, 17 mm marine ply
Piano Hinges	2 (stainless steel)
Screws for Hinges	4 total
Rubber strip	Thin rubber strip to cover hinges
Screws	20 x 40 mm stainless steel screws
Silastic	To seal boxes
Box lining	To insulate box - crushed termite nest are ideal, or strips of paperbark
Teks Screw	2 screws; recommend 3/8 hex head; >80 mm/3 inches. Either Teks (self-drilling) or coach screws to screw into tree – stainless steel
Timber Seal	An organic seal to preserve your box – e.g. Lanotec's Timber Seal, Tung Oil
PVC Pipe	30 – 40 mm diameter, 5 – 10 mm length (x 2 pieces) for installation 'spacers'

Equipment

Material	Notes
Bench saw	To cut timber lengths
Screwdriver	For box construction
Drill	For drainage and entrance hole
32 mm (Sugar) or 41 mm (Squirrel) hole saw (drill bit)	For entrance hole: -Sugar Glider: standard 29 mm, 30 mm, or 32 mm hole saw drill bits are suitable -Squirrel Glider: standard 41 mm, 43 mm or 44 mm hole saws
6 mm drill bit or similar	For drainage holes
Saw or Router (optional)	To roughen the box sides for better grip
Extension Ladder	4 m or taller
Cordless drill	For installation - a high power drill is best
3/16 drill bit	For installation
3/8 hex-head driver and/or 3/8 socket and driver	For installation
Socket wrench	Helpful to tighten screws into tree (especially if using tek screws)

Prepare the Pieces

1. Cut timber to the dimensions below to make the pieces. Dimensions are for 17 mm ply and will need to be adjusted for other materials.
2. Bevel cut the rear edge of the lid at 85°, and the front 5° to match. This is critical so the lid will sit!
3. (optional) Bevel the edges of the baffle to help it fit snug
4. Use a hole saw to cut the large entrance hole (~30 mm for Sugar Glider or ~40 mm for Squirrel Glider) in the right side panel. A side entrance is easier access for possums than a front one.
5. Prepare for assembly. Drill pilot holes into plywood before screws to avoid splitting. It's good to countersink the holes as well in preparation for the screws. It can help to tack together the box with a nail gun before inserting the screws – this makes it easier to assemble and ensures everything fits together well.
6. Drill holes for the support screws in the back panel. Use a larger bit to add a larger hole at the lower end of the top hole – this creates a 'keyhole' shape which will help when installing the box
7. Drill some small holes in the base panel for drainage
8. Use a bench saw or router to cut a grid in the side panel, internal sides, and both sides of the baffle. This will give animals something to grip when climbing into the box – or you can place a small branch inside for them to use.

Construction

9. Prepare the joints with Silastic or similar sealant and screw together the back, front, sides and base of the box
10. Nail or screw the baffle inside the box. The baffle gives the box some protection from the outside elements and reduces the use by pest species or predators
11. Install the piano hinges to connect the lid and the main box

Coating the box

12. Now you can coat the box. An organic timber seal is preferable - e.g. Lanotec's Timber Seal, Tung Oil or similar.

Installation

13. Select a suitable site for your installation and erect a ladder (remember safety first)
14. Add two handfuls of your insulation (e.g. paperbark etc) to make the box cosy
15. (optional) Dip the installation screws in organic lubricating oil (e.g. Lanotec) to coat and avoid rusting
16. Carefully climb the ladder (without the box) and install the upper support screw.

    a. Drill a 3/16 hole into the tree at the designated height and screw in the 100mm Tek Screw to about ½ its length using a 3/8 hex-head driver (or equivalent)

    b. Now place the PVC Spacer over the screw. This spacer keeps the box off the growing tree surface
17. Now carry up the box and hang it over the screw using the top 'keyhole'. Use the hex driver to tighten this screw.
18. Now place the second (lower) PVC spacer between the box and tree, and drill a hole for the lower screw (place the drill through the lower hole so it's straight). Install the lower screw and use the hex driver to secure this
19. Make sure the box is secure and tighten screws with a wrench if necessary. Your nest box should now be ready for use. Congratulations!

Feathertail Glider, Pygmy Possum & Antechinus

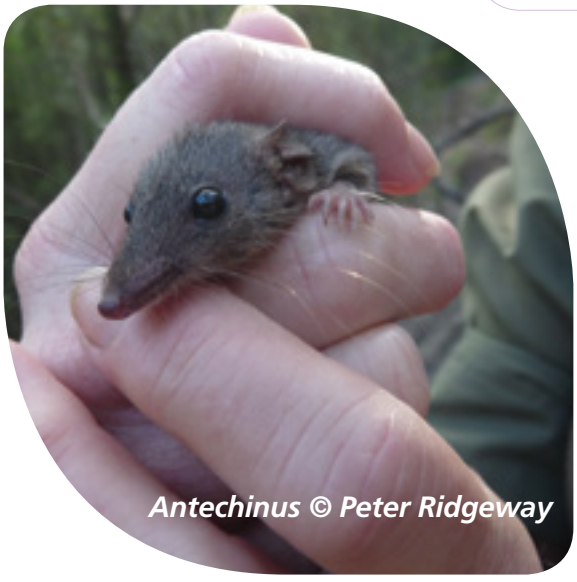
These three tiny animals are each declining in the region and have similar nesting requirements.

Feathertail Gliders are very small gliding possums which hang out in shrubbery and in the treetops. They feed on small insects and nectar. The gliders have special membranes between their front and rear legs which allow them to glide between trees & bushes and roost either singly or in small groups.

Pygmy Possums are a tiny possum found in the sandstone country. They feed on small insects and nectar particularly Banksia.

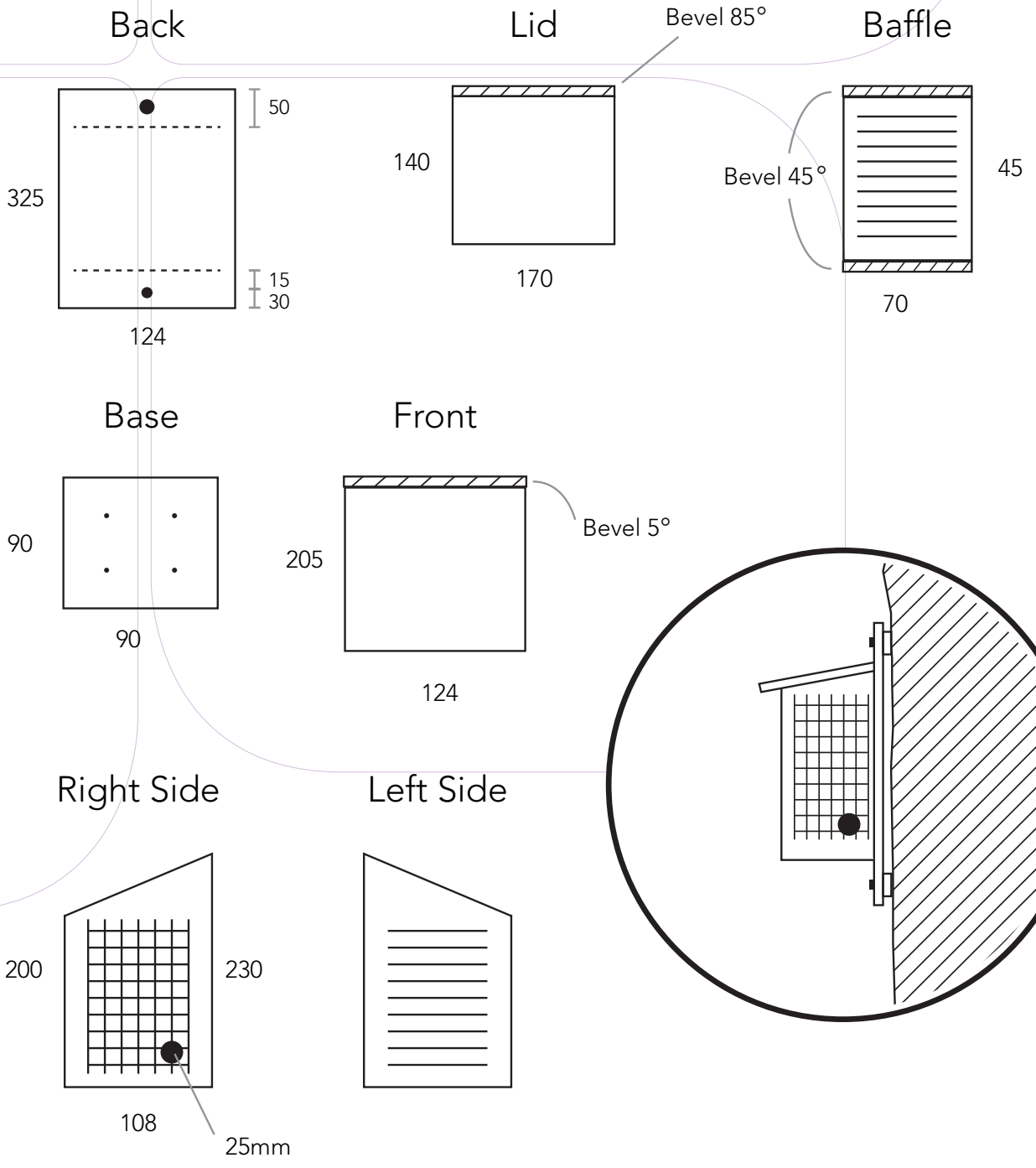
Antechinus are small marsupials which look a little like mice or shrews. They have huge ears and eyes and make excellent predators catching all sorts of small insects at night. They are common in sandstone areas but very rare elsewhere.

Feathertail Glider © Akos Lumnitzer



Antechinus © Peter Ridgeway

Feathertail/Antechinus/Pygmy Possum (17mm ply)



Attachment with PVC Pipe 'spacer'

Materials

Material	Quantity (per box)
Timber	2 m length, 200 mm wide, 17 mm marine ply
Screws for Hinges	4 total
Rubber strip	Thin rubber strip to cover hinges
Screws	20 x 40 mm stainless steel
Silastic	To seal boxes
Box lining	To insulate box – crushed termite nest is ideal, or strips of paperbark
Teks Screw	2 screws; recommend 3/8 hex head; >80 mm/3 inches. Either Teks (self-drilling) or coach screws to screw into tree – stainless steel
Timber Seal	An organic seal to preserve your box – e.g. Lanotec's Timber Seal, Tung Oil
PVC Pipe	30 – 40 mm diameter, 5 – 10 mm length (x 2 pieces) for installation 'spacers'

*These smaller boxes are best made with a fixed lid. If a hinged lid is added an eyelet hook and felt will be needed to ensure the lid is secure.

Equipment

Material	Notes
Bench saw	To cut timber lengths
Screwdriver	For box construction
Drill	For drainage and entrance hole
25 mm hole saw (drill bit)	For entrance hole – standard size
6 mm drill bit or similar	For drainage holes
Saw or Router (optional)	To roughen the box sides for better grip
Extension Ladder	4 m or taller
Cordless drill	For installation - a high power drill is best
3/16 drill bit	For installation
3/8 hex-head driver and/or 3/8 socket and driver	For installation
Socket wrench	Helpful to tighten screws into tree (especially if using tek screws)

Prepare the Pieces

1. Cut timber to the dimensions below to make the pieces. Dimensions are for 17 mm ply and will need to be adjusted for other materials.
2. Bevel cut the rear edge of the lid at 85°, and the front 5° to match. This is critical so the lid will sit!
3. (optional) Bevel the edges of the baffle to help it fit snug
4. Use a hole saw to cut the large entrance hole (25 mm) in the right side panel. A side entrance is easier access for possums than a front one.
5. Prepare for assembly. Drill pilot holes into plywood before screws to avoid splitting. It's good to countersink the holes as well in preparation for the screws. It can help to tack together the box with a nail gun before inserting the screws – this makes it easier to assemble and ensures everything fits together well.
6. Drill holes for the support screws in the back panel. Drill some small holes in the base panel for drainage
7. Use a bench saw or router to cut a grid in the side panel, internal sides, and both sides of the baffle. This will give animals something to grip when climbing into the box – or you can place a small branch inside for them to use.

Construction

8. Prepare the joints with Silastic or similar sealant and screw together the back, front, sides and base of the box
9. Nail or screw the baffle inside the box. The baffle gives the box some protection from the outside elements and reduces the use by pest species or predators
10. Install the lid. (Optional) Install the piano hinges to connect the lid and the main box. You may need to add a hook & eye latch to keep the lid firm on these smaller boxes

Coating the box

11. Now you can coat the box. An organic timber seal is preferable - e.g. Lanotec's Timber Seal, Tung Oil or similar.

Installation

12. Select a suitable site for your installation and erect a ladder (remember safety first)
13. Add two handfuls of your insulation (e.g. paperbark etc) to make the box cosy
14. (optional) Dip the installation screws in organic lubricating oil (e.g. Lanotec) to coat and avoid rusting
15. Carefully climb the ladder and install the upper support screw.

    a. Drill a 3/16 hole into the tree at the designated height

    b. Screw in the upper 100mm Tek Screw through the box and PVC spacer

    c. Now screw in the lower screw and use a hex driver to tighten if necessary.
16. Your nest box should now be ready for use. Congratulations!

Microbats

Microbats are tiny insect-eating bats which use ultrasonic sonar to navigate at night.

There are over 20 different species in Western Sydney each with their own peculiarities. There is even a local microbat which specialises in feeding from lakes and dams. The 'Fishing Bat' uses its long toes to skim the water and pluck small fish and insects from the surface.

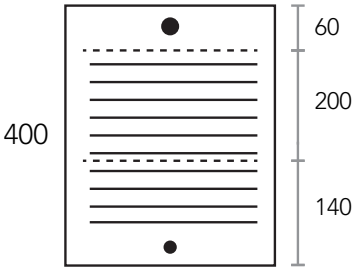
Microbat nest boxes have their own unique design. The box has a series of slits inside and the bats squeeze in to roost between them. Microbats come in different sizes so it's important to offer different sized gaps in the box to suit them.

You can easily do without a hinged lid on the microbat boxes. The best way to monitor them is to just look up into the slits. You can sometimes see the bats fly out at dusk. Bats can roost solitarily but a good box will also suit small colonies including the critical breeding females.

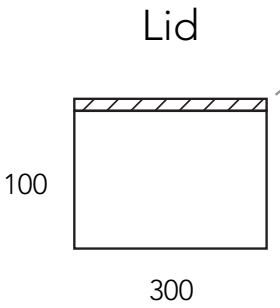
Microbat © Peter Ridgeway

Microbat (17mm ply)

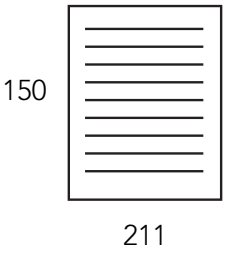
Back



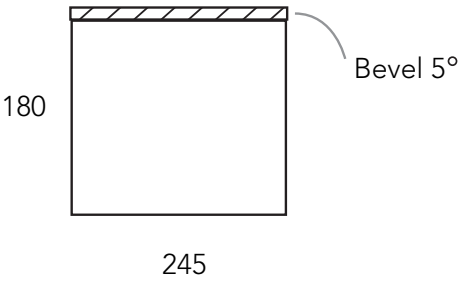
Lid

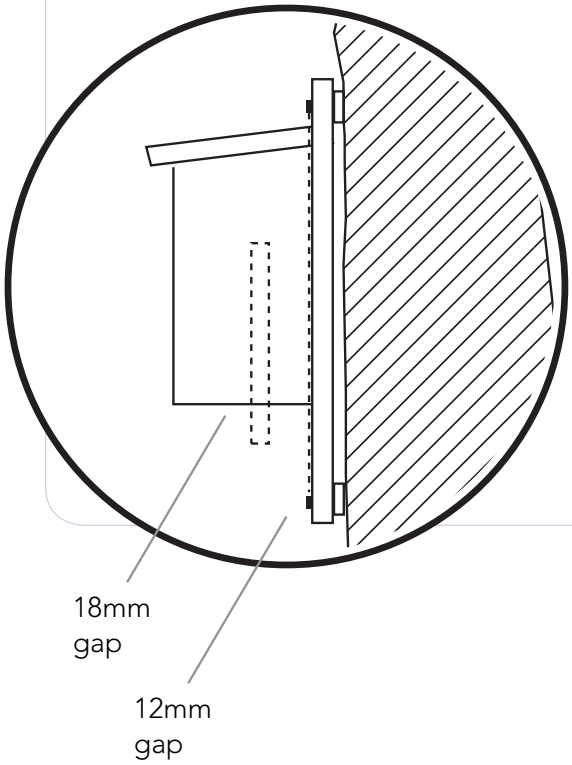


Baffle

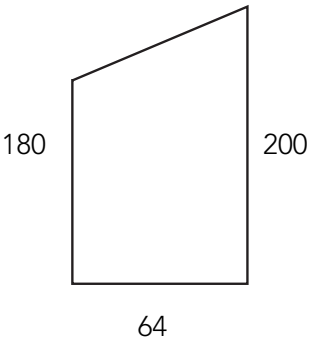


Front

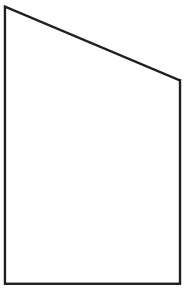




Right Side



Left Side



Attachment with PVC Pipe 'spacer'

Materials

Material	Quantity (per box)
Timber	3 m length, 200 mm wide, 17 mm marine ply
Screws	20 x 40 mm stainless steel screws
Silastic	To seal boxes
Teks Screw	2 screws; recommend 3/8 hex head; >80 mm/3 inches. Either Teks (self-drilling) or coach screws to screw into tree – stainless steel
Timber Seal	An organic seal to preserve your box – e.g. Lanotec's Timber Seal, Tung Oil
PVC Pipe	30 – 40 mm diameter, 5 – 10 mm length (x 2 pieces) for installation 'spacers'

Equipment

Material	Notes
Bench saw	To cut timber lengths
Hammer and/or screwdriver	For box construction
Extension Ladder	4 m or taller
Cordless drill	For installation - a high power drill is best
3/16 drill bit	For installation
3/8 hex-head driver and/or 3/8 socket and driver	For installation

Prepare the Pieces

1. Cut timber to the dimensions below to make the pieces. Dimensions are for 17 mm ply and will need to be adjusted for other materials.
2. Bevel cut the rear edge of the lid at 85°, and the front 5° to match. This is critical so the lid will sit!
3. (optional) you can hinge the lid but this is not generally recommended for bat boxes
4. Prepare for assembly. Drill pilot holes into plywood before screws to avoid splitting. It's good to countersink the holes as well in preparation for the screws. It can help to tack together the box with a nail gun before inserting the screws – this makes it easier to assemble and ensures everything fits together well.
5. Drill holes for the support screws in the back panel.
6. Use a bench saw or router to cut a grid in the back and all inner panels. This will give animals something to grip when climbing into the box

Construction

7. Prepare the joints with Silastic or similar sealant and screw together the back, front and sides of the box
8. Nail or screw the baffle inside the box. The gaps between baffle and walls are critical. These boxes have two hollows a narrow (12 mm) and thicker (18 mm) plus an open space above the top. This gives options for different microbat species.

Coating the box

9. Now you can coat the box. An organic timber seal is preferable - e.g. Lanotec's Timber Seal, Tung Oil or similar.

Installation

10. Select a suitable site for your installation and erect a ladder (remember safety first)
11. (optional) Dip the installation screws in organic lubricating oil (e.g. Lanotec) to coat and avoid rusting
12. Carefully climb the ladder and install the upper support screw.

    a. Drill a 3/16 hole into the tree at the designated height

    b. Screw in the upper 100mm Tek Screw through the box and PVC spacer

    c. Now screw in the lower screw and use a hex driver to tighten if necessary.
13. Your nest box should now be ready for use. Congratulations!

Red-rumped Parrot/Musk Lorikeet

There's nothing more beautiful than raising your own parrots. However most nest boxes for parrots target the species which don't need our help – Cockatoos and Rainbow Lorikeets in particular.

The Red-rumped Parrot and Musk Lorikeet are smaller than our other parrots and they are not doing well. Nest boxes can make a big difference in reversing their decline, and because they are small their boxes are less prone to invasion by more aggressive (larger) species.

The Red-rumped Parrot are often called the 'Grass Parrot'. They spend much of their time on the ground where they feed on grass seeds. Red-rumped Parrot like to feed and nest in fairly exposed (open) areas, so make sure you consider this when locating your nest box.

Musk Lorikeet feed on sugar and lerps (small insects on gum leaves). They prefer a slightly smaller nest box opening than the Red-rumped Parrots.

© Edwin Vella

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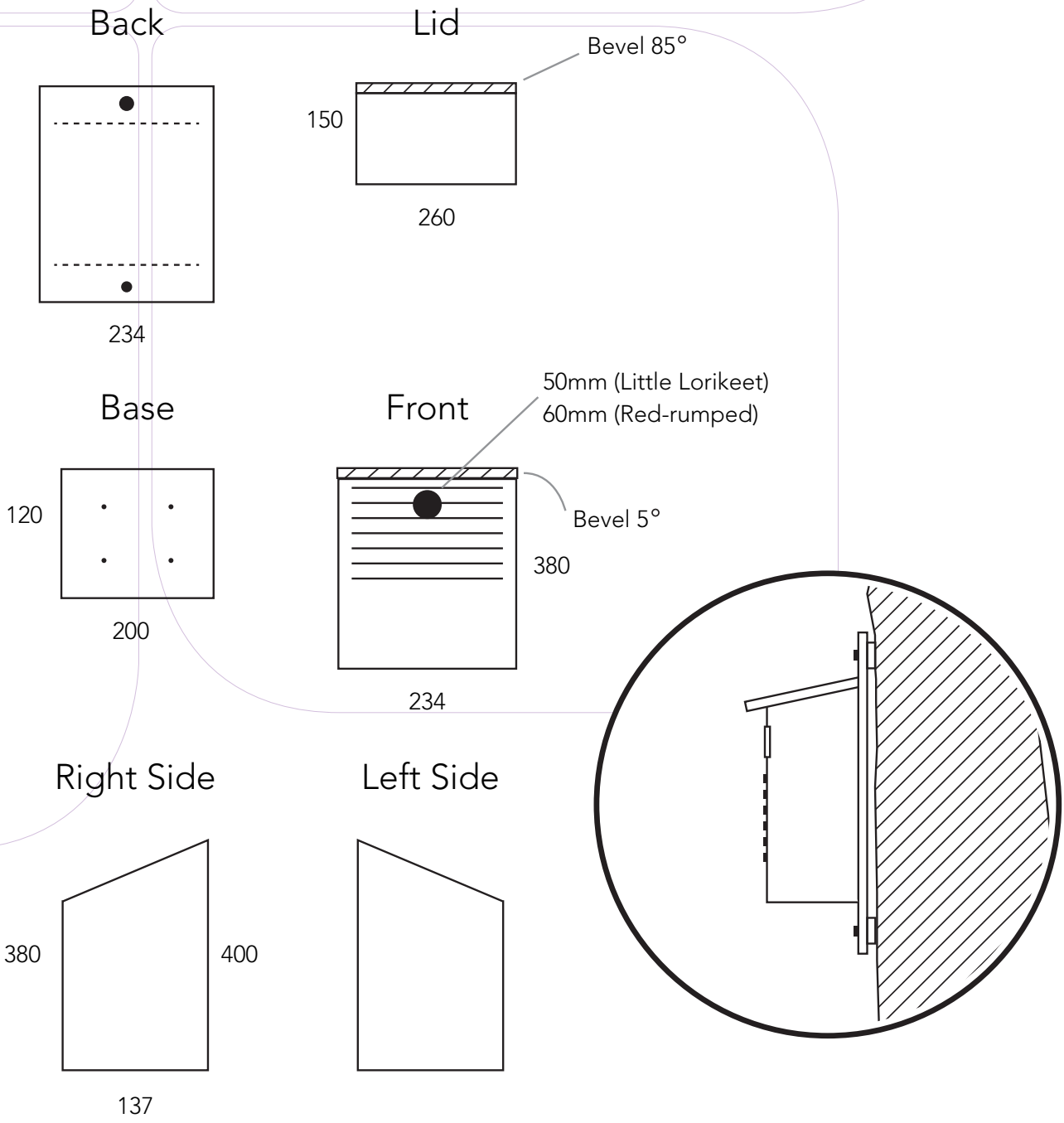
Attachment with PVC Pipe 'spacer'

Red-rumped Parrot/Little Lorikeet (17mm ply)



Materials

Material	Quantity (per box)
Timber	3 m length, 200 mm wide, 17 mm marine ply
Piano Hinges	2 (stainless steel)
Screws for Hinges	4 total
Rubber strip	Thin rubber strip to cover hinges
Screws	20 x 40 mm stainless steel screws
Silastic	To seal boxes
Box lining	To insulate box - crushed termite nest are ideal, or strips of paperbark
Teks Screw	2 screws; recommend 3/8 hex head; >80 mm/3 inches. Either Teks (self-drilling) or coach screws to screw into tree – stainless steel
Timber Seal	An organic seal to preserve your box – e.g. Lanotec's Timber Seal, Tung Oil
PVC Pipe	30 – 40 mm diameter, 5 – 10 mm length (x 2 pieces) for installation 'spacers'

Equipment

Material	Notes
Bench saw	To cut timber lengths
Screwdriver	For box construction
Drill	For drainage and entrance hole
Hole saw (drill bit)	For entrance hole – standard sizes include 51 mm (for Little Lorikeet) and 64 mm (for Red-rumped Parrot), or smaller 48 mm and 59 mm) if you can find them
6 mm drill bit or similar	For drainage holes
Saw or Router (optional)	To roughen the box sides for better grip
Extension Ladder	4 m or taller
Cordless drill	For installation - a high power drill is best
3/16 drill bit	For installation
3/8 hex-head driver and/or 3/8 socket and driver	For installation
Socket wrench	Helpful to tighten screws into tree (especially if using tek screws)

Prepare the Pieces

1. Cut timber to the dimensions below to make the pieces. Dimensions are for 17 mm ply and will need to be adjusted for other materials.
2. Bevel cut the rear edge of the lid at 85°, and the front 5° to match. This is critical so the lid will sit!
3. Use a hole saw to cut the entrance hole. Make it just under 60 mm for Red-rumped Parrot or just under 50 mm for Little Lorikeet.
4. Prepare for assembly. Drill pilot holes into plywood before screws to avoid splitting. It's good to countersink the holes as well in preparation for the screws. It can help to tack together the box with a nail gun before inserting the screws – this makes it easier to assemble and ensures everything fits together well.
5. Drill holes for the support screws in the back panel. Use a larger bit to add a larger hole at the lower end of the top hole – this creates a 'keyhole' shape which will help when installing the box
6. Drill some small holes in the base panel for drainage
7. Use a bench saw or router to cut a grid in the front panel and internal sides. This will give animals something to grip when climbing into the box – or you can place a small branch inside for them to use.

Construction

8. Prepare the joints with Silastic or similar sealant and screw together the back, front, sides and base of the box
9. Install the piano hinges to connect the lid and the main box, and cover with rubber for protection.

Coating the box

10. Now you can coat the box. An organic timber seal is preferable - e.g. Lanotec's Timber Seal, Tung Oil or similar.

Installation

11. Select a suitable site for your installation and erect a ladder (remember safety first)
12. Add two handfuls of your insulation (e.g. paperbark etc) to make the box cosy
13. (optional) Dip the installation screws in organic lubricating oil (e.g. Lanotec) to coat and avoid rusting
14. Carefully climb the ladder (without the box) and install the upper support screw.

    a. Drill a 3/16 hole into the tree at the designated height and screw in the 100mm Tek Screw to about ½ its length using a 3/8 hex-head driver (or equivalent)

    b. Now place the PVC Spacer over the screw. This spacer keeps the box of the growing tree surface
15. Now carry up the box and hang it over the screw using the top 'keyhole'. Use the hex driver to tighten this screw.
16. Now place the second (lower) PVC spacer between the box and tree, and drill a hole for the lower screw (place the drill through the lower hole so it's straight). Install the lower screw and use the hex driver to secure this
17. Make sure the box is secure and tighten screws with a wrench if necessary. Your nest box should now be ready for use. Congratulations!

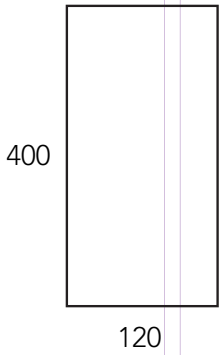
Pardalotes

Pardalotes are lovely little birds which feed on psyllids. Psyllids or 'lerps' are insects which feed on the sap in tree leaves and may cause tree dieback. So it's great to have a local pair doing their bit to keep nature in balance.

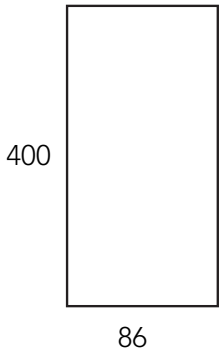
Pardalotes naturally nest in tunnels they dig in the banks of creeks or other soil. However despite this habit they quite like wooden nest boxes of the right shape & size. Pardalotes are declining in the suburbs and bushland so it's great to give them a hand this way.

Pardalote (17mm ply)

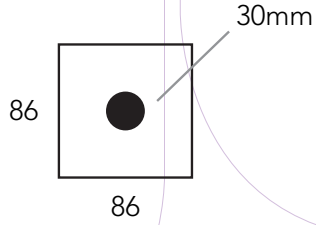
Sides (x2)



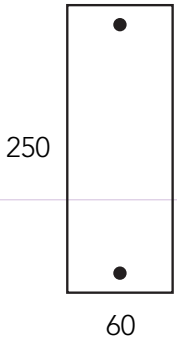
Top/Bottom (x2)

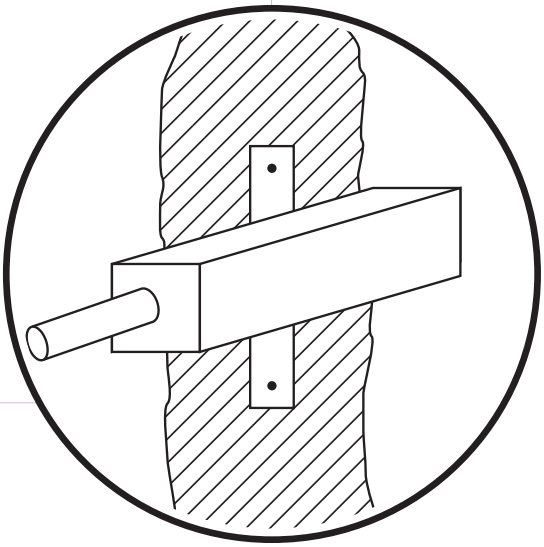


Front

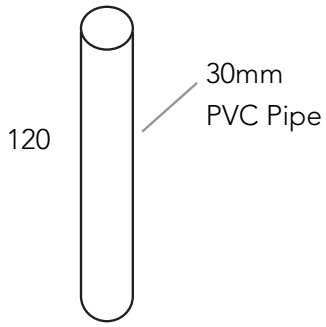


Support





Entrance



Materials

Material	Quantity (per box)
Timber	3 m length, 200 mm wide, 17 mm marine ply
Screws	20 x 40 mm stainless steel screws
Silastic	To seal boxes
Box lining	To insulate box - crushed termite nest are ideal, or strips of paperbark bark
Teks Screw	2 screws; recommend 3/8 hex head; >80 mm/3 inches. Either Teks (self-drilling) or coach screws to screw into tree – stainless steel
Timber Seal	An organic seal to preserve your box – e.g. Lanotec's Timber Seal, Tung Oil
PVC Pipe	30 – 40 mm diameter: -120 mm for entrance tube -5 – 10 mm length (x 2 pieces) for installation 'spacers'

Equipment

Material	Notes
Bench saw	To cut timber lengths
Screwdriver	For box construction
Drill	For drainage and entrance hole
30 mm hole saw (drill bit)	For entrance hole – should fit the PVC pipe snug
Extension Ladder	4 m or taller
Cordless drill	For installation - a high power drill is best
3/16 drill bit	For installation
3/8 hex-head driver and/or 3/8 socket and driver	For installation
Socket wrench	Helpful to tighten screws into tree (especially if using tek screws)

Prepare the Pieces

1. Cut timber to the dimensions below to make the pieces. Dimensions are for 17 mm ply and will need to be adjusted for other materials.
2. Use a hole saw to cut the entrance hole – this should fit the PVC pipe snugly
3. Prepare for assembly. Drill pilot holes into plywood before screws to avoid splitting. It's good to countersink the holes as well in preparation for the screws. It can help to tack together the box with a nail gun before inserting the screws – this makes it easier to assemble and ensures everything fits together well.

Construction

4. Prepare the joints with Silastic or similar sealant and screw together the back, front, sides and base of the box
5. Insert the PVC entrance pipe and secure in place with Silicone
6. Install the side panel for attachment to tree

Coating the box

7. Now you can coat the box. An organic timber seal is preferable - e.g. Lanotec's Timber Seal, Tung Oil or similar.

Installation

8. Select a suitable site for your installation and erect a ladder (remember safety first)
9. Add two handfuls of your insulation (e.g. paperbark etc.) to make the box cosy
10. (optional) Dip the installation screws in organic lubricating oil (e.g. Lanotec) to coat and avoid rusting
11. Carefully climb the ladder and attach the box. You will need screws through each end of the attachment plate
12. Make sure the box is secure and tighten screws with a wrench if necessary. Your nest box should now be ready for use. Congratulations!

Recycling Materials / Design your own

Recycling surplus materials can be a great way to make your boxes more sustainable. However you need to make sure the boxes are durable, suitable dimensions, and do not deprive other animals of a home. Before you start ask yourself:

- Are the materials durable? Key weaknesses are joints, cracks and roofs.
- Is the box the correct dimensions? Refer to the design notes for each species and pay particular attention to the entrance size, entrance orientation, and internal size.
- Do the materials deprive other wildlife of a home? Hollow logs are critical habitat for our ground-dwelling wildlife and best left on the ground (see insert).

Saving hollow logs

It's really important to make sure you are not stealing one animals home to make another!

Hollow logs on the ground are critical to provide a home, shelter and food to wildlife such as Bandicoots, Frogs and Birds. Removing them to build nest boxes deprives these animals of their homes.

You can help native wildlife by leaving hollow logs on the ground. Tree hollows can also be rescued from chipping after pruning work or at Council depots, and placed back on the ground for habitat.

Further information

The ***Hollows for Habitat*** Forum held at Newington Armory (May 2015) brought together nest box expertise from across the region. The proceedings summarise local nest box programs and include practical tips on using nest boxes for different species of wildlife: http://greatersydney.lls.nsw.gov.au/__data/assets/pdf_file/0005/566627/hollows-for-habitat-proceedings.pdf

Nest boxes work best when combined with the restoration of wildlife habitat. For tips on how to create wildlife habitat in your garden or farm check out the Habitat Network (www.habitatnetwork.org/resources.htm)

Nest boxes can be built inside trees as well. **Pruning** or **habitat creation** involves cutting a nest box into a tree during arboriculture work and is becoming increasingly popular. The Victorian Tree Industry Association **Pruning for Habitat** workshop notes are a great place to start (http://vtio.org.au/wp-content/uploads/2010/09/Vtio_Habitat_Paper_SEPT_2010.pdf)

Greater Sydney Local Land Services provides free advice and assistance in habitat restoration and biodiversity recovery. If you would like to know more you can **contact us** at:

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An Antechinus nest box using recycled fence palings