

**ARTIFICIAL HOLLOW PROVISION PROGRAM FOR THE MERRI CREEK  
ENVIRONS - A FEASIBILITY ASSESSMENT**

**Merri Creek Management Committee**

**Dec 2018**



*Spotted Pardalote © Peter Mollison*

*Nest Box suitable for Striated Pardalote, available  
from LaTrobe University Wildlife Sanctuary*

## Acknowledgements

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The Merri Creek Environment Fund is a tax-deductible fund which aims to ensure the preservation of the natural and cultural heritage of Merri Creek and its tributaries, their corridors and associated ecological communities. <https://www.mcmc.org.au/about-merri-creek/merri-creek-env-fund>

## Questions & Comments

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## SUMMARY

- Artificial hollows and nestboxes are a potential option for increasing the habitat quality of restoration sites along the Merri Creek. They could provide additional habitat for hollow-dependent fauna in areas where hollows are absent or in short supply and, in the middle and upper reaches of the catchment, improve habitat connectivity between remaining important hollow-bearing woodlands.
- The range of species that could benefit can be identified from programs conducted in similar urban contexts at Darebin Parklands and the Latrobe Wildlife Reserves.
- Recent studies have identified limitations of common box design such as poor thermal insulation, and failing to attract wildlife when attached to small or medium trees. These studies warn against contemplating offset arrangements that sacrifice natural hollows for artificial.
- In urban areas, unless teamed with intensive Common Mynah eradication, there is a high likelihood of nesting failure by target species such as the Eastern Rosella. Common Mynah eradication is very resource intensive and requires careful management of community perceptions.
- Stick-mounted cameras, ‘endoscope’ style cameras, and wireless camera are less invasive and hazardous than direct inspections and their use should be considered in nestbox site selection and design.
- Elevated Work Platforms potentially address some hazards of installation and maintenance but have important limitations.
- Training in rope-work and installation by arborists are other options for reducing the hazard of working at height however ongoing costs of maintenance need to be considered.
- An approach creating artificial hollows using chainsaw cuts into younger, living trees is currently being assessed by Latrobe University in neighbouring catchments and there is interest by researchers in Merri sites. Benefits of this approach include better thermal qualities and maintenance.

## KEY RECOMMENDATIONS

- Undertake a trial artificial hollows project at Merri Park, Northcote
- Use boxes suitable for small bird species such as Pardalotes and for Microbats.
- Purchase boxes from a reputable supplier.
- Install nest boxes using a skilled arborist.
- Train volunteers to monitor nest boxes with supervision of monitoring by skilled personnel during first year.
- Use wireless inspection camera with an extension pole
- Publicise project and disseminate information to interested community.

## 1. Introduction

There is strong community interest in the provision of bird habitat along Merri Creek. An important aspect of bird habitat is the provision of artificial hollows in the absence of naturally formed hollows in the relatively young revegetation along the lower Merri Creek. This report reviews the experience of other organisations and individuals in providing artificial hollows and considers the feasibility and costs of an artificial hollow project for Merri Creek.

The background information has been assembled from:

- existing MCMC publications;
- reference to nestbox guidelines recently published online by the Arthur Rylah Institute;
- reference to some recent research articles on nestbox programs;
- reference to articles and publications from the Biolinks Alliance Glideways Symposium in 2016 - supplied by Ann McGregor;
- discussion with the following stakeholders:
  - Stephen Griffiths – A Latrobe University researcher investigating the use of chainsaw hollows as an alternative to traditional nestboxes;
  - Peter Wiltshire, Head Ranger at the Darebin Creek Management Committee who has been overseeing a nestbox program and Common Mynah control.
  - Luke Sandham, manager of the Darebin City Council Bush Crew which has had a small number of maintained nestboxes in parkland on the Merri Creek for nearly twenty years.
  - Michael Cincotta- Latrobe Wildlife Reserves where nestboxes have been installed for over forty years.

## 2. Objectives for a Merri Creek nestbox scheme

The Arthur Rylah Institute's 'Guidelines for nestbox programs' (Macak & Platt, 2018) recommends identifying the answer to the following question 'What species (single or multiple) are you trying to target and why?' The first example objective suggested in this guideline is:

*'Provide additional habitat for hollow-dependent fauna in areas where hollows are absent or in short supply'*

This is the situation on the lower Merri Creek - south of Mahoneys Road - where virtually all native vegetation in open space consists of revegetation less than 30 years old. It takes about 70 years for *small* hollows to form and 100 years for large hollows (Macak & Platt, 2018). Only a few Plains Grassy Woodland remnant sites in the lower catchment retain more than a scattering of isolated large old trees, namely:

- Yarra Bend Park - the 260 ha of this park was considered to have approximately 50% native vegetation cover (Beardsell, 2003). This 130 ha includes patches of woodlands with large old trees containing hollows. Areas of these woodlands are contiguous with the lower Merri Creek.
- Northern Memorial Park Glenroy - Fawkner Cemetery, approximately 1.5 kilometres from the Merri Creek where there are approximately 125 large old River Redgum and Greybox.

(Large trees defined as diameter at Breast height of >60cm) (Merri Creek Management Committee, 2011).

- Important remnant woodland is present in the adjoining Moonee Ponds Creek catchment at Northern Golf Course- Glenroy (and adjoining Westbreen Creek) within 4 kilometres of the Merri Creek where there are approximately 200 large old trees- River Redgum, Greybox and Yellow Box (Merri Creek Management Committee, 2011).

In the middle reaches of the Merri, from Craigieburn East Road to Mahoneys Road, the extent of surrounding suitable habitat and connectivity to native vegetation suggests an additional objective:

*'...improve connectivity between existing hollow –bearing woodlands.'*

Important hollow-bearing woodlands are found:

- along the creek at Bababi Marning (Cooper Street Grassland) Reserve to Galada Tamboore where a few dozen large River Redgum remain in the plains and Creekside.
- Galgi Ngarrk (Craigieburn Grassland) Reserve - where perhaps a hundred old Redgums remain. This area is contiguous with important extensive remnant Plains Grassy Woodland at Epping where hundreds of mature Redgums remain within pasture land under various tenures and levels of protection.

Unless artificial hollow provision is made, some bird species will continue to be absent or need to leave the lower Merri environs during breeding probably for at least 70 years until revegetation reaches hollow-formation stage. Associated ecological relationships (e.g. invertebrate predation by bats and Pardalotes) potentially also suffer. Community engagement opportunities of a nestbox program will also be missed.

### 3. What species could be assisted?

Based on the results supplied by other urban nestbox schemes (Wiltshire & Mann, 2016) and from Latrobe University (M. Cincotta pers. comm. 12/11/18) the following species might be expected to be promoted through use of nestboxes:

#### **Mammals**

- Microbats - in particular Goulds Wattled Bat and White-striped Freetail Bat. Six to eight species have been recorded from Latrobe University.
- Possums - Brushtail and Ring-tail possums ('particularly benefitted' (Goldingay, et al., 2018))
- Sugar Gliders - have recently colonised Darebin Parklands, perhaps moving from the Yarra Parklands near Clifton Hill or Latrobe Wildlife Reserve and adjoining areas along the Darebin Creek. Sugar Gliders are recorded in the woodlands in the upper catchment of the Merri Creek. M. Cincotta suggested nestboxes may be a means of identifying presence/absence and monitoring re- colonisation of the Merri Creek by this species (pers. comm. 12/11/18)

#### **Birds**

- Eastern Rosella - have used boxes at Darebin Parklands however breeding success is severely impacted by Common Mynahs (Wiltshire & Mann, 2016).

- Red-rumped Parrot appear to rarely use local nestboxes. The species appears to favour small hollows in large old trees (M. Cincotta 12/11/18). Nesting has been observed in Redgums along Champ Street, Coburg but only two nestings in boxes by Red-rumped Parrots have been observed .
- Rainbow Lorikeet - Lorikeets use nesting boxes at Darebin Parklands. This species is tolerant of urban conditions and is possibly 'over-abundant' locally due to street and parkland plantings that generate a year-long abundance of nectar. This may impact other hollow nesters.
- Musk Lorikeet - is recorded using nestboxes at Latrobe University.
- Striated Pardalote - is present along the Merri in areas with old mature hollow-bearing gums including Northern Memorial Park and the Northern Golf Course. Will use 'Pardalote' nest boxes.
- Spotted Pardalote will use the Pardalote nestbox however its effectiveness for this species is improved through adding a 'spout' (M. Cincotta 12/11/18).
- Australian Wood Duck - will readily use duck boxes.
- Boobook Owl

#### **4. Life of project**

The Arthur Rylah Institute Guidelines recommend that before nest boxes are installed it is useful to discuss when to end the project. What is the useful life of the boxes? Will they be removed if there is a lack of occupancy or an ongoing problem with pest animals? Who will be responsible for their removal? (Macak & Platt, 2018).

A large cohort of trees along the lower Merri Creek originate from Bicentennial plantings in 1988, suggesting that artificial provision of hollows would be the main potential resource available to wildlife in the lower Merri for at least another 70 years.

The estimated useful life of nesting boxes ranges from 10 years (Macak & Platt, 2018) to several decades if maintained (Goldingay, et al., 2018). M. Cincotta (pers. comm 12/11/18) estimated the life of the Latrobe Wildlife Reserve boxes to be approximately 10 years with 2 yearly maintenance. The lifespan is considerably lengthened by screwing down the lid (previously needed as access for monitoring which can now be done using camera). Chainsaw hollows are presumed to have an indefinite lifespan - with maintenance (Griffiths, et al., 2018).

#### **5. What local examples are available and most relevant to consider?**

The urban context of the Merri is closest to the Darebin Parklands and the Latrobe Wildlife Reserves. The impacts of human disturbance and presence of high populations of Common Mynah are important considerations (Goldingay, et al., 2018).

## 6. What kind of artificial hollow should be considered?

### *Purchased boxes*

Benefits of purchasing ready-made boxes are time savings and consistency. Latrobe Wildlife Reserve has some ability to make informed adjustments to their designs and have a very high level of expertise in making and using the designs they sell. Other suppliers presumably will have similar benefits.

Some cost savings may be possible through purchasing as 'Flat pack' and doing final assembly by volunteers. Risks include relatively high cost (from approx. \$50 to \$112 for Latrobe boxes).

### *Volunteer made boxes*

Many nestbox programs involve construction by volunteers such as Men's Sheds using the designs available online. This has the benefits of being a cost saving, makes it possible to tailor boxes to a higher quality and generate a high level of engagement and community 'ownership'.

Risks include the time involved in ensuring the many finer points of nestbox construction are achieved such as need to source appropriate non-toxic paint types, sustainably sourced timbers.

### *Hollow log hollows*

As described by Griffiths et al (2018) hollow log hollows are natural sections of log, split in half, gouged with chainsaw to form a hollow and entrance and then re-assembled. They have thermal properties close to natural hollows and are relatively quick to assemble when constructed by a skilled chainsaw operator. The irregular sizes, shapes and weights of the resulting hollows would make them more difficult to erect and a source of green logs is needed to construct the hollows. They would be more difficult to clean and maintain than constructed boxes.

### *Chainsaw hollows*

Chainsaw hollows for bats and Sugar Gliders have been created using thrust cuts into large living trees. The trees need to be relatively large (diameter at breast height (DBH) of >40cm). Chainsaw hollows are the closest to natural hollows in terms of thermal properties and potentially the least maintenance and visually obtrusive. Hollows may be installed in trees that contain faults likely to result in future limb failures, simultaneously removing a source of future cost and risk and creating a hollow (Griffiths, et al., 2018).

Installation needs to be by skilled arborists. Candidate trees may be hard to find in younger revegetation stands and the technique is still relatively new in Australia. One of the researchers of this technique has identified suitable trees in revegetation along the Merri Creek and is interested in seeing trials conducted (Stephen Griffith, pers. comm. 29/10/18).

## 7. Installation

Selection of boxes in appropriate sites and correct installation is important for effectiveness (temperature control, and maintenance/longevity (Goldingay, et al., 2018). One study has demonstrated that hollow nesting birds are significantly attracted only to nestboxes attached to larger trees (>80cm dbh) (Le Roux, et al., 2016).

Installation can be awkward. Many projects appear to have relied on volunteers to install and maintain nestboxes; however this raises many OHS issues and is likely to be unacceptable to current land managers.

MCMC staff could be trained to install boxes safely. Darebin Council have advised they are not considering the use of ladders for future nestbox programs due to safety issues and are considering the potential of Elevated Work Platforms (EWP) instead (Luke Sandham pers. comm. 29/10/18). Training in use of EWPs is not expensive and trailer-towed EWPs can be hired locally. EWP use among trees is not simple however and is intrinsically limited by the access, precluding their use in many of the secluded areas in parkland where timid wildlife may prefer to nest. Michale Cincotta (pers comm. 12/11/18) suggests rope-work training as a more versatile expertise to develop if committing to an extensive nestbox program.

Arborists can be hired to install boxes. This has the benefit of transferring risk almost entirely to appropriately trained, equipped and insured operators, obviously at a commensurate cost.

## 8. Monitoring and Maintenance

### *Monitoring*

It is essential that nest boxes be monitored to determine whether they are being successfully used and whether invasive species such as bees, Common Mynah or Starlings have taken them over.

Methods include:

- Direct inspection
- Camera on stick
- Installed remote camera

It is feasible for trained volunteers to undertake this type of monitoring and highly desirable that the results are disseminated to interested community and agencies.

### *Maintenance*

Apart from maintenance of the structural integrity of the nest boxes (described at 4.), a critical aspect of monitoring and maintenance is to remove invasive species that may have colonised nest boxes. At the Darebin Parklands, the most frequently found invasive species is the Common Mynah. An intensive daily program of trapping and humane destruction undertaken by a volunteer and resulted in very significant reduction in the Common Mynah population (Wiltshire & Mann, 2016).

## 9. Existing nestbox result databases

Arthur Rylah Institute has an information sheet on monitoring of nestboxes and includes examples of Excel-based data entry with data sheet (and meta-data details of nest box) (Macak, 2018). This guideline advises submitting data to the Victorian Biodiversity Atlas.

## 10. Community Engagement

Latrobe Wildlife Reserves and Darebin Creek Management Committee have developed presentations suitable for community information sessions, based on their experiences of nestboxes.

Nestbox schemes are attractive projects for engaging community interest.

Nestbox schemes require appropriate messaging that avoids generating undesirable public interactions with active nestboxes that could impact on nesting success and animal welfare.

## 11. Costs and Funding

The Arthur Rylah Institute 'Guidelines for nestbox programs' (Macak & Platt, 2018) state that these need to be considered to be eligible for funding under the Department of Environment, Land, Water and Planning (DELWP) Community & Volunteer Action Grants.

## 12. Recommendations for Merri Creek Artificial Hollows Trial Project

The following approach is recommended as prudent and financially feasible, for a project cost of around \$13,000. It takes into account Merri Creek Management Committee's lack of direct experience with provision of artificial hollows.

- Undertake a trial nest box project at Merri Park, Northcote of 10 Pardalote boxes and 10 microbat boxes. *There is suitable vegetation, easy access and a high level of existing community connection to the area. **Estimated cost of project management: \$2,700 (includes data management and dissemination).***
- Use nest boxes suitable for small bird species such as Pardalotes and for Microbats which are too small to be used by the invasive Common Mynah. *Intensive monitoring, trapping and destruction of Common Mynahs is not feasible unless undertaken by dedicated and reliable volunteers. Community perceptions also need careful management when killing birds.*
- Purchase nest boxes from a reputable supplier. *Although the idea of community made nest boxes is attractive, purchased boxes are going to be more reliable in the first instance. This needn't preclude future community initiatives to make nest boxes. **Estimated cost: 20 boxes @\$70 each = \$1,400.***
- Install nest boxes using a skilled arborist. *This is the most cost effective and reliable method of installing nest boxes. It is not an activity that can be undertaken safely by volunteers. **Estimated cost for 20 boxes: \$2,000.***
- Train volunteers to monitor nest boxes with supervision of monitoring by skilled personnel during first year. *There is huge scope to engage community in the monitoring of nest boxes, potentially initially through people already involved in the Friends of Merri Creek quarterly bird surveys. During the nesting season, monitoring will need to be undertaken monthly. **Estimated cost for 6 training/monitoring sessions: \$4,600.***
- Use Wireless inspection camera with extension pole for monitoring **Estimated cost: \$1,075**
- Publicise project and disseminate information to interested community. *There is huge scope to engage community through publicising the project and offering community events such as an information evening with a presentation from Darebin Creek Management Committee. **Estimated cost: \$1,600***

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