

Standard Operating Procedure

NEST BOXES FOR MONITORING ARBOREAL MAMMALS

Prepared by: Species and Communities Branch, Science and Conservation, Department of Biodiversity, Conservation and Attractions

Prepared for: Animal Ethics Committee

Version 1.1

October 2017



Department of **Biodiversity,**
Conservation and Attractions

Department of Biodiversity, Conservation and Attractions
Locked Bag 104
Bentley Delivery Centre WA 6983
Phone: (08) 9219 9000

www.dbca.wa.gov.au

© Department of Biodiversity, Conservation and Attractions on behalf of the State of Western Australia 2017

This work is copyright. You may download, display, print and reproduce this material with suitable acknowledgement. Requests and enquiries concerning reproduction and rights should be addressed to the Department of Biodiversity, Conservation and Attractions.

This standard operating procedure was prepared by the Species and Communities Branch, Science and Conservation Division, Department of Biodiversity, Conservation and Attractions.

Questions regarding the use of this material should be directed to:

Principal Zoologist
Species and Communities Branch
Department of Biodiversity, Conservation and Attractions
Locked Bag 104
Bentley Delivery Centre WA 6983
Phone: (08) 9219 9511
Email: fauna@dbca.wa.gov.au

The recommended reference for this publication is:

Department of Biodiversity, Conservation and Attractions (2017). *Standard Operating Procedure: Nest Boxes for Monitoring Arboreal Mammals*. Perth, WA: Department of Biodiversity, Conservation and Attractions.

Disclaimer

The State of Western Australia and its employees do not guarantee that this publication is without flaw of any kind or is wholly appropriate for your particular purposes and therefore disclaims all liability for any error, loss or other consequence that may arise from you relying on any information in this publication.

Revision history log

Version	Date	Details	Author/Reviewer	Approval
1.0	2009	Document created	Christine Freegard & Vanessa Richter	March 2009
1.1	16/05/2017	Minor revision	Georgina Yeatman and Manda Page	August 2017

Approvals


Version 1.1


Approved by:  Date: 17/08/2017

Dr Manda Page

Principal Zoologist, Species and Communities Branch, Department of Biodiversity, Conservation and Attractions

Version 1.0

Approved by:  Date: 4.3.09
 Peter Orell
 Western Shield Zoologist, DEC Species and Communities Branch

Approved by:  Date: 5-3-09
 Keith Morris
 Fauna Program Leader, Science Division

This document has been reviewed and endorsed by the Department's Animal Ethics Committee

Acknowledgments

This standard operating procedure was originally developed by Christine Freegard and Vanessa Richter, with contributions from Peter Orell and Peter Mawson.

Contents

1 Purpose	5
2 Scope	5
3 Definitions	6
4 Procedure Outline	6
4.1 Nest box construction and installations.....	6
4.2 Checking nest boxes and data collection	7
5 Level of Impact	7
6 Ethical Considerations.....	7
6.1 Handling time	8
6.2 Young in nest box	8
6.3 Injury and unexpected deaths	8
6.4 Prescribed fuel reduction burning	8
7 Competencies and Approvals.....	8
8 Occupational Health and Safety.....	9
8.1 Animal bites, stings and scratches	9
8.2 Zoonoses	10
8.3 Use of a ladder	10
9 Further Reading.....	10
10 References.....	10

1 Purpose

Some small mammals that use tree hollows and that are not readily caught in cage traps or Elliott traps can be monitored by using nest boxes (Figure 1). These species include, but are not limited to, red-tailed phascogale (*Phascogale calura*), south-western brush tailed phascogale (*P. tapoatafa*), yellow-footed antechinus (*Antechinus flavipes*) and western pygmy possum (*Cercartetus concinnus*).

This standard operating procedure (SOP) provides advice on the use of nest boxes for monitoring arboreal mammals.



Figure 1 Nest box attached to Jarrah tree. Photo: Christine Freegard/DBCA

2 Scope

This SOP has been written specifically for scientific and education purposes, and endorsed by the Department's Animal Ethics Committee. However, this SOP may also be appropriate for other situations.

This SOP applies to all fauna survey and monitoring activities involving the use of nest boxes for arboreal mammals undertaken across the State by Department of Biodiversity, Conservation and Attractions (hereafter Department) personnel. It may also be used to guide fauna monitoring activities undertaken by Natural Resource Management groups, consultants, researchers and any other individuals or organisations. All Department personnel involved in monitoring using nest boxes should be familiar with the content of this document.

Projects involving wildlife may require a licence under the provisions of the *Wildlife Conservation Act 1950* and/or the *Biodiversity Conservation Act 2016*. Personnel should consult the Department's Wildlife Licensing Section and Animal Ethics Committee Executive Officer for further guidance. In Western Australia any person using animals for scientific purposes must also be covered by a licence issued under the provisions of the *Animal Welfare Act 2002*, which is administered by the Department of Primary Industries and Regional Development. This SOP complements the *Australian code of practice for the care and use of animals for scientific purposes* (The Code). The Code contains an introduction to the ethical use of animals in wildlife studies and should be referred to for broader issues. A copy of the code may be viewed by visiting the National Health and Medical Research Council website (<http://www.nhmrc.gov.au/>).

3 Definitions

Animal handler: A person listed on an application to the Department’s Animal Ethics Committee who will be responsible for handling animals during the project.

Arboreal: An arboreal animal is one which spends large amounts of time inhabiting or frequenting trees.

Nest box: A man-made structure designed to meet the needs of hollow-dependent species for nesting and shelter. It can be made so that occupants can be observed and monitored.

4 Procedure Outline

4.1 Nest box construction and installations

(a) Nest boxes for arboreal mammals should preferably be constructed of rough sawn Jarrah or other Australian native hardwoods for longevity but may also be constructed of softwoods. *Note: DO NOT use softwoods treated with toxic preserving chemicals such as copper or arsenic.*

(b) Design and dimensions will vary depending on the requirements of the target species. Staff should research the most appropriate nest box design for a target species. Factors to consider include the size of the entrance hole, position of entrance hole (e.g. low positioned holes could be blocked by nesting material) and shape of the nest box. Figure 2 provides an example of one nest box design.

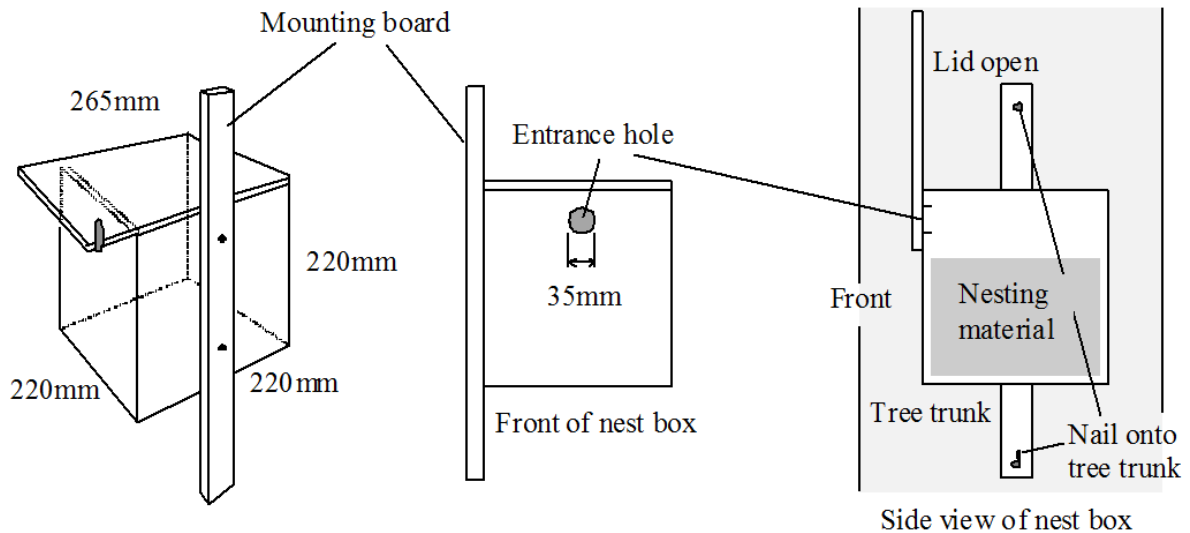


Figure 2 Nest box design and specifications

(c) Nest boxes should be filled two thirds with nesting material consisting of dry shredded Jarrah bark or similar.

(d) Nest boxes should be securely fastened to tree trunks 3-5m above ground level, positioned to provide shelter from the sun and rain (see Figure 3). They need to be accessible by ladder and trees should be selected with this in mind. Fasten the nest box side on to the tree for ease of opening and inspection.

- (e) Nest box locations (e.g. transect vs. grid and number of traps) will be determined by the purpose of the study.
- (f) Nest boxes must be numbered

Optional: A small strip of hair tube wafer or double sided tape may be attached to the entrance of the nest box for collection of guard hairs that may be used to identify species using the nest box.

4.2 Checking nest boxes and data collection

- (a) Nest boxes can be left for long periods of time without checking; however, they should ideally be monitored twice a year.
- (b) The nest box entrance must be blocked during the inspection and for a short time after inspection to reduce the chance of escape and possible predation if nocturnal animals are disturbed during the day.
- (c) If required, animals that are in the box at the time of checking may be captured by hand (see Department SOPs *Hand Capture of Wildlife* and *Hand Restraint of Wildlife* for further advice), removed from the box, identification confirmed and other observations and measurements taken. The animals must then be returned to the nest box.
- (d) Minimum data requirements are: date, location, nest box number, signs of animal presence (scats, fur, etc., collect for identification) and probable species, or, if present, species of animal, number and sex of individuals if possible.
- (e) Data should be recorded on the *Western Shield Nest Box Data Sheet* (accessed within Fauna File) and entered into Fauna File.

5 Level of Impact

Potential animal welfare impacts of nest boxes include:

- Trauma (e.g. accidental injuries inflicted during hand capture)
- Hypothermia or Hyperthermia (e.g. due to poor positioning of nest box)
- Dehydration (e.g. due to poor positioning of nest box)
- Distress (e.g. caused by hand capture)
- Predation (e.g. due to increased vulnerability of nocturnal animals being released during the day)

Positioning of the nest box can greatly affect their useability and impact the comfort of occupants. The negative impacts of nest boxes on the welfare of animals are low and are potentially an overall positive impact in areas where natural hollows are scarce.

6 Ethical Considerations

To reduce the level of impact of nest boxes on the welfare of animals there are a number of ethical considerations that should be addressed. Department projects involving nest boxes for monitoring will require approval from the Department's Animal Ethics Committee.

6.1 Handling time

To ensure minimal stress to the animals they should only be handled for as long as required to identify them and to collect any necessary measurements (usually no more than five minutes).

6.2 Young in nest box

If young are encountered in the nest box, disturbance should be kept to a minimum. It is better to forego measurements on young animals than risk injury or having the mother abandon them.

6.3 Injury and unexpected deaths

If injury, unexpected deaths or euthanasia occur then it is essential to consider the possible causes and take action to prevent further deaths. For projects approved by the Department's Animal Ethics Committee, adverse events such as injury, unexpected deaths or euthanasia must be reported in writing to the AEC Executive Officer on return to the office (as per 2.2.28 of The Code) by completing an *Adverse Events Form*. Guidance on field euthanasia procedures is described in the Department SOP for *Humane Killing of Animals under Field Conditions*. Where disease may be suspected, refer to the Department SOP for *Managing Disease Risk in Wildlife Management* for further guidance.

6.4 Prescribed fuel reduction burning

Animals in nest boxes may be at risk from fire. Rake away all dry fuel within 2m of the supporting tree trunk prior to the burn commencing to reduce the chance of the nest box being burnt in high fire risk areas or if a prescribed burn is scheduled.

7 Competencies and Approvals

Department personnel, and other external parties covered by the Department's Animal Ethics Committee, undertaking nest box monitoring projects require approval from the committee and will need to satisfy the competency requirements detailed in Table 1. This is to ensure that personnel involved have the necessary knowledge and experience to minimise the potential impacts of nest boxes on the welfare of the animals. Other groups, organisations or individuals using this SOP to guide their fauna monitoring activities are encouraged to also meet these competency requirements as well as their basic animal welfare legislative obligations.

It should be noted that details such as intensity of the study being undertaken will determine the level of competency required and Table 1 provides advice for basic monitoring only.

Table 1 Competency requirements for Animal Handlers of projects using nest boxes to monitor arboreal mammals

Competency category	Competency requirement	Competency assessment
Wildlife licences	Licence to take fauna for scientific purposes (Reg 17) OR Licence to take fauna for educational or public purposes (Reg 15)	Provide licence number
Formal training <i>Note: Suitable levels of skills/experience can substitute for formal training requirements</i>	Department Fauna Management Course or equivalent training	Provide course year
General skills/experience	Relevant knowledge of species biology and ecology	Personnel should be able to correctly identify the likely species to be encountered when checking nest boxes. Familiarity with biology and ecology of target species will assist in project design and positioning nest boxes. This knowledge may be gained through sufficient field experience and/or consultation of literature.
Animal handling and processing skills/experience	Experience in handling terrestrial mammal fauna	Personnel should be confident at hand capture and handling of species likely to be encountered when checking nest boxes. This experience is best obtained under supervision of more experienced personnel. Estimated total time in field: Min 1 year involved in similar projects.

8 Occupational Health and Safety

Always carry a first aid kit in your vehicle and be aware of your own safety and the safety of others as well as the animals when handling.

A job safety analysis is recommended prior to undertaking monitoring using nest boxes at your site. This safety analysis should include the following considerations.

8.1 Animal bites, stings and scratches

It is important to remember that occupants of the nest box may not welcome being disturbed and may inflict bites, stings or scratches. Bees, spiders and other invertebrates may be disturbed by checking nest boxes and can inflict irritating stings or bites. Arboreal mammals can also inflict minor injuries during hand capture. All injuries should be

appropriately treated as soon as possible to ameliorate possible allergic reaction, prevent infection and promote healing.

If Department personnel or volunteers are injured, please refer to the Department's Health and Safety Section's 'Report a Hazard, near-miss or incident' intranet page, which can be found at http://intranet/csd/People_Services/rm/Pages/ReportingHazards,Near-MissesandIncidents.aspx.

8.2 Zoonoses

There are a number of diseases carried by animals that can be transmitted to humans (i.e. zoonoses such as Toxoplasmosis, Leptospirosis, Salmonella). All personnel must take precautions to minimise the risk of disease transmission to protect themselves, their families and wildlife populations.

Advice on minimising disease risk is contained in the Department SOP for *Managing Disease Risk in Wildlife Management*.

8.3 Use of a ladder

Take care when positioning the ladder to check nest boxes to ensure that it is stable and in a suitable position for easy access to the nest box. Avoid use in wet weather when the ladder may be slippery.

9 Further Reading

The following SOPs have been mentioned in this advice and it is recommended that they are considered when proposing to undertake monitoring using nest boxes.

- Department SOP *Hand Capture of Wildlife*
- Department SOP *Hand Restraint of Wildlife*
- Department SOP *Humane Killing of Animals under Field Conditions*
- Department SOP *Managing Disease Risk in Wildlife Management*

Additional information on the use of nest boxes for monitoring fauna may be found in Beyer and Goldingay (2006), who reviewed published literature and assessed the research and management value of using nest boxes for arboreal marsupials.

Beyer, G.L. and Goldingay, R.L. (2006). The value of nest boxes in the research and management of Australian hollow-using arboreal marsupials. *Wildlife Research* 33(3): 161-174.

10 References

NHMRC (2004). *Australian code of practice for the care and use of animals for scientific purposes* (7th ed.). Canberra, ACT: National Health and Medical Research Council, Commonwealth of Australia.

Rhind, S. (1998). *Ecology of the brush-tailed phascogale in jarrah forest of southwestern Australia* (PhD Thesis). Murdoch, WA: Murdoch University.