Connecting Country

YELLOW BOX WOODLAND PROJECT

NEST BOX PROGRAM



Nest Box Monitoring Field Guide

CONTENTS

Author: Bryan McMullan (Connecting Country) – May 2012

Acknowledgements

Chris Timewell (Connecting Country), Marie Jones (Connecting Country), Elizabeth Mellick (Norman Wettenhall Foundation), Amy Monagle (Deakin University), Greengraphics Team, Max Schlacter (Landcare Facilitator – Mt. Alexander), Glen Harrison (Chewton Bushlands Association), Deanna Neville (Muckleford Landcare), Landholders/nest box custodians, Connecting Country Committee of Management

Cover page from left to right: Brush-tailed Phascogale nest; Sugar Gliders in nest box; Sugar Glider nest (all photos by Bryan McMullan, Connecting Country)

Foreword

Connecting Country has a vision "to connect people and landscapes in the management of a healthy, resilient and productive natural environment". The Yellow Box Woodland Project is a major step in achieving this vision. Connecting Country is committed to a grassroots approach to land and biodiversity management and is a strong advocate in community engagement, reconnecting habitat and using good science in decision making. Two of the three principles that guide Connecting Country are demonstrated in the delivery of the nest box monitoring program, namely the education and engagement of local land users to improve landscape management and to use links with communities to monitor and assist with landscape-scale changes in biodiversity.

With these principles in mind the Yellow Box Woodland Project - Nest Box Monitoring Strategy strives to use strategically placed nest boxes to observe and monitor the distribution of arboreal animals, in particular the threatened Brush-tailed Phascogale (also known as the Tuan).

The purpose of this guide is to assist landholders and nest box custodians in understanding the process of a nest box survey. The guide will also assist observers with the identification of nest box occupants, with a particular focus on making a distinction between the Tuan and the Sugar Glider, two of the most common colonisers of Connecting Country nest boxes in the Mt Alexander Shire and immediate surrounds.

By training land managers and other community members to observe landscape change, it is hoped that participants will gain knowledge in local ecology, share knowledge for the betterment of natural resource management and continue the monitoring program into the future.

Connecting Country
The Hub, Office 15
233b Barker Street, Castlemaine
PO Box 437, VIC 3450
03 5472 1594
info@connectingcountry.org.au

The animals

Phascogale tapoatafa

or

Brush-tailed Phascogale

or

Tuan

The **Brush-tailed Phascogale** is a nocturnal arboreal marsupial that is listed as a threatened species under the Victorian *Flora and Fauna Guarantee Act 1988*. Adults will grow to a length of approximately 30cm (incl. tail) and when startled may 'bound excitedly' with their black bottle-brush tail erect. Individuals are predominantly covered in a deep grey fur, with a pale underbelly and have ears that are bald.

Across the Goldfields Bioregion, the Tuan's habitat preferences are "dry open forest and woodland, especially box-ironbark-stringybark on ridges and slopes, stumps and fallen timber, and a well-established layer of leaf litter" (Tzaros 2005). The Tuan is predominantly carnivorous and will tear at tree bark to access moths, beetles and grubs and forage in forest floor litter for arthropods. They are also known to feed on eucalypt nectar, bird eggs and hatchlings (Tzaros 2005).

With this in mind, the Tuan may be observed on the forest floor as well as on the main trunk and branches of trees. They are known to be very agile and can move along the underside of tree limbs and will run headfirst down tree trunks. The Tuan is predominantly a solitary animal and rarely vocalises, so one would not expect to hear a Tuan call during a nest box survey.

Petaurus breviceps

or

Sugar Glider

The **Sugar Glider** is considered to be reasonably common in Box-Ironbark ecosystems but its abundance will vary according to the presence or absence of certain shrub layer vegetation and the availability of tree hollows. They are communal creatures and will live in groups of 3-8, however, when observed foraging they will often be encountered alone (Tzaros, C. 2005). They are known to be fast on foot and when leaving nest boxes they often ascend the parent tree straight to the canopy. Their markings are very distinctive and include a black stripe from its nose, over its head and along its back, while the rest of the coat is mainly grey. Sugar Gliders have a white underbelly and the last quarter of their tail is black. Some individuals will have a white tip at the end of the tail and adults will grow up to 33cm long (incl. tail). Sugar Gliders are omnivorous and will eat a wide range of foods depending upon seasonal availability including pollens, tree saps, honeydew, a range of invertebrates and insect exudates. Feeding habits can be useful information when identifying a Sugar Glider as they can be observed foraging in flowering tree canopies, especially *Eucalypt and Acacia*. Other behaviours that may be telling to the observer include the Sugar Glider's reputation for making 'yap, yap' calls on bright moonlit nights.

Other animals – few other animals are expected to use Connecting Country nest boxes, which have been specifically designed for the Brush-tailed Phascogale. On rare occasions, additional animals may be observed using nest boxes such as; feral bees, Owlet Nightjars, lorikeets, parrots, reptiles and frogs.

Environmental conditions

The weather patterns of the central Victorian Goldfields can be variable and sometimes unpredictable. Tuans and Sugar Gliders will generally not venture out of their hollows in wild winds and extreme cold events.

The moon cycle is also known to influence the chances of seeing nocturnal animals. On bright moon-lit nights, the likelihood of small animals being preyed upon is increased, therefore their activity decreases. Although this is a general rule of thumb, behaviours will vary from time to time and place to place.

To improve your chances of observing and identifying animals in the wild, it is preferable to perform your surveys during calmer weather conditions and when the moon is either ≤ 70% full or covered by clouds.

Nest box location and installation

Over 400 nest boxes have been installed across the Mt Alexander region and have been placed in different landscape types including gullies and ridges (see diagrams on p. 6). Other placement characteristics have been considered during installation such as vegetation patch size including patches of less than 50 hectares and patches that are greater than 50 hectares in size.

In most cases, Connecting Country nest boxes will be installed upon a rough barked tree with a diameter at breast height (DBH) of 30cm or more. They will be placed on the south-eastern side of the tree and be located 3m above the forest floor with the nest box entrance against the tree trunk. At each nest box site there should be three nest boxes all within 50m of each other. Each nest box installed by Connecting Country has a unique identifying code, which is written on the underside of the box and should be observable from ground level.

Gullies or Slopes - Nest box Placement

Gully vegetation – small (< 50 ha) patch

- Areas with gullies or drainage lines typically moister areas with more fertile soils – typical tree species are Yellow Box and River Red-Gum
- Small remnants disconnected from large woodland or forest blocks

Gully vegetation – large (> 50 ha) patch

- Areas with gullies or drainage lines typically moister areas with more fertile soils – typical tree species are Yellow Box and River Red Gum
- Well connected or within large woodland/forest remnants

Ridge/slope vegetation – small (< 50 ha) patch

- Sites on dry slopes and ridges with poorer soils – typical tree species are Grey Box, Red Stringybark, Yellow Gum and Red Box.
- Small remnants disconnected from large woodland or forest blocks

Ridge/slope vegetation – large (> 50 ha) patch

- Sites on dry slopes and ridges with poorer soils – typical tree species are Grey Box, Red Stringybark, Yellow Gum and Red Box.
- Well connected or within large woodland/forest remnants

Monitoring

Nest box monitoring is best performed during Autumn (March to May), which is when the Tuan will be quite active and looking for breeding partners. This will increase the chance of observing a Tuan in action and will minimize the likelihood of observers disturbing females in their maternal activity. Juvenile Tuans dispersing from nests may also be observed from early Summer onwards.

Connecting Country advocates a sit and wait approach in performing a nest box occupancy survey such as described on our Nest box monitoring data sheet (see reference list for web address). For observer safety and animal welfare it is not recommended to use ladders or to climb trees to determine to contents of a nest box. The preferred method of nest box observation is to establish a sit and wait position within line of site of the nest box entrance for the purpose of observing the animal alighting from the box in a natural manner. In this particular situation, the sit and wait survey, otherwise known as a stag watch, should be performed between the 15 minutes leading up to twilight and 15 minutes after. If an animal is not heard or observed in the allotted half hour, then it is safe to assume that the nest box is not currently occupied.

Given that the survey is performed in poorly lit conditions, spotlighting is an accessible and reliable technique for identifying the target species. If you are unable to positively identify an animal in the natural light available, as a last resort we recommend the use of a torch or spotlight. This will help you to identify the distinguishing features of an animal, which can then be compared with images and diagrams contained within this guide. The use of artificial light to identify animals at night will often reflect the eye shine that is synonymous with nocturnal species. The eye shine of the Tuan for example will be red to pale red, however this colouration is virtually the same in the case of the Sugar Glider. When using artificial light to identify a nocturnal animal, make sure you hold the beam of light off-centre to the animal as this will reduce the impact one may have on its vision and to spotlight an individual for no longer than 20 seconds.

As there are other animals known to use nest boxes and a number of them will display eye shine, it is important to use a range of characteristics and behaviours to accurately identify them. This is when fur texture, body shape, animal size and other markings should be used to further clarify your identification. Certain animals will also display unique behavioural traits such as the way they move when travelling between destinations, by demonstrating territory and niches such as foraging zones.

The following pages of this guide will outline some of the features so that you can accurately identify and report your findings.

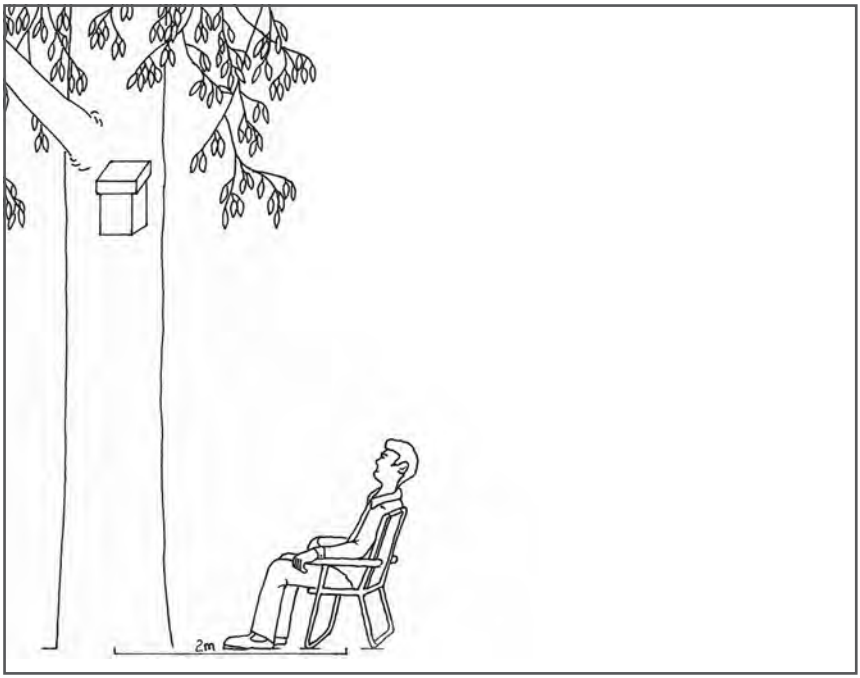
Equipment

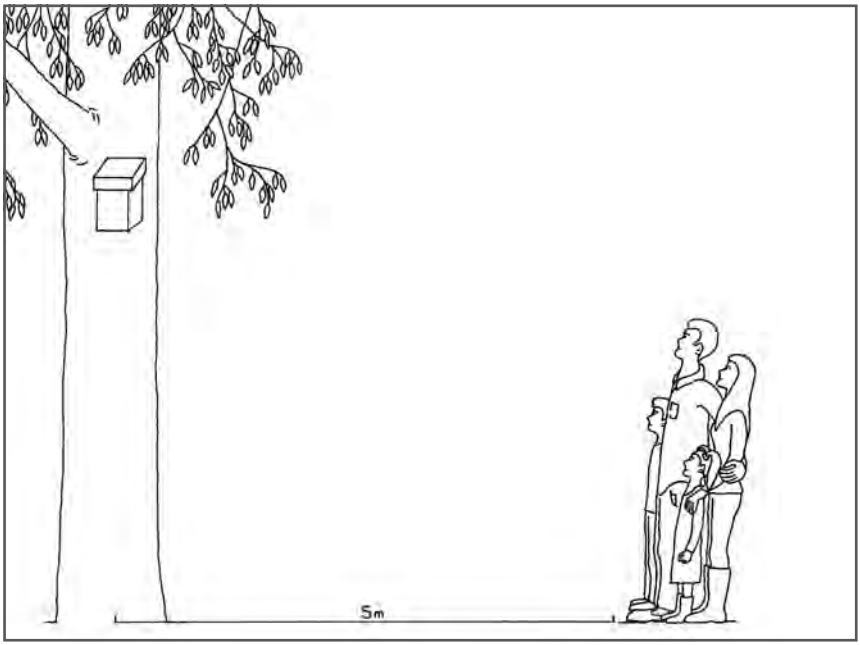
ESSENTIAL: Clip board, data sheet/s, pen/pencil/sharpener, LED torch/headtorch, chair, mosquito repellent, warm clothing (weather dependent), spare batteries
OPTIONAL: camera, GPS

Method

1. Travel to a specific nest box site approximately 10 minutes before official sunset time and familiarise yourself with surrounds.
2. Establish a sit and wait position within line-of-sight of the space between the nest box entrance and the host tree trunk (the entrance will be facing the tree trunk).
3. Distance between your position and the box should be reduced according to your ability to keep still and quiet during the survey period (≈ 30min.). Very quiet and still observers can sit within 2m of the tree however, larger groups will need to keep further away, up to 5m for example.
4. You should be in place, quiet and still within 15 minutes of twilight (twilight times will generally lag sunset times by approx. 20 min.). Local sunset times can be found readily on the internet such as ***www.weatherzone.com.au/vic/north-central/castlemaine***
5. The survey should continue for a minimum of 15 minutes past twilight but for the purpose of our project, you can finish once a positive identification is achieved.
6. When movement is observed around the nest box opening, see if you can identify the animal in the natural light available by observing its shape and size (silhouettes are often great indicators of species).
7. As a final measure, turn on your torch and track the animal to identify distinguishing features. If an animal bolts for the canopy, try to resist the temptation to stand up and make a fuss (noise and movement will make these animals flighty).
8. If you have time, turn your torch off and wait for another five minutes to see whether you can spy another individual exiting (with sugar gliders it is quite likely that another will emerge after the first).

NB: As arboreal animals are known to occupy more than one nest site within a home range on different nights, it is good practice to survey all nest boxes at your chosen site. When monitoring is undertaken by a single observer or in small groups (2-3), it may be best to concentrate efforts on a single box per night. In larger groups however, two or three boxes within one site may be monitored effectively at the same time. Experience will influence your group's initial output but field practice will give rise to a streamlined process. You may even decide to monitor each box more than once during a monitoring season.


2m


5m

Identification of Tuan vs Sugar Glider

Tuan	Head/face
	Flat and pointed face, uniform grey colour (no white!), single short black stripe (distinctive from nose to neck)

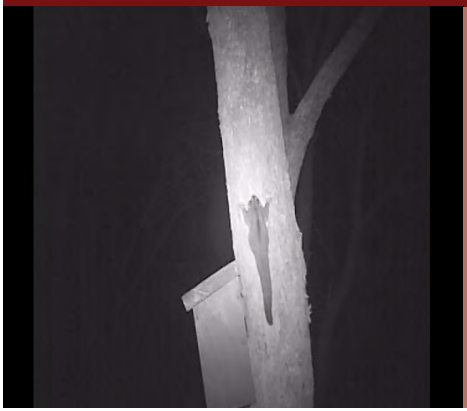
Sugar Glider	Head/face
	Rounded face, several distinct black stripes, rounded white patches under ears

Tuan

Tail

Most tail fur is black and coarse. Tail will often be on end (brushy) when active

Sugar Glider



Tail

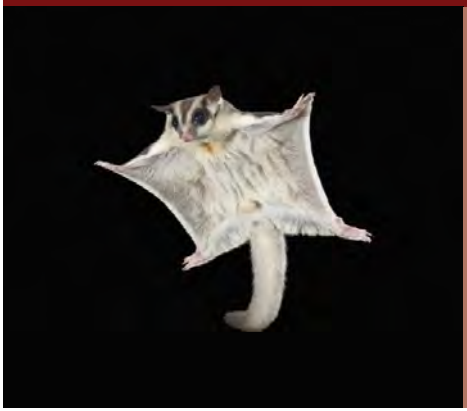
Grey and black furry tail sometimes with a white tip, uniform in size and texture

Tuan

Behaviour

A very agile animal that can be observed bounding up and down tree trunks. May jump short distances among trees and traverse along the underside of major braches. Will often be observed foraging among leaf litter at ground level

Sugar Glider



Behaviour

Can be observed gliding from tree top to tree top and will move up and down tree trunks with agility. Is rarely observed upon the ground

Tuan

Signs and traces

When a Tuan is preyed upon by an owl, the tail will often be discarded.

Tuan's will forage for food such as tree borer grubs in trees, which leaves exposed holes up to 10mm in width

Sugar Glider

Signs and traces

Sugar Gliders are very active and numerous, so wear marks on nest box entrances and upon adjacent tree trunks can often be attributed to Sugar Glider presence

Tuan

Size (Adult)

head/body; 150-260mm, tail; 165-235mm (Strahan, 1992)

Sugar Glider

Size (Adult)

head/body; 160-200mm, tail; 165-210mm (Strahan, 1992)

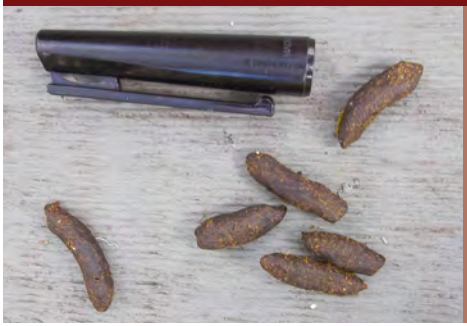
Tuan

Scat

Uniformly long and cylindrical scats with visible twists, often partially or fully comprising insect material. The dark to black scat will have a strong odour when fresh (Triggs 2004)

Sugar Glider

Scat



Short and narrow cylindrical droppings, primarily made up of fine powdery particles. Colour can vary according to diet from dark brown to dark green (Triggs 2004)

Data Sheets

Copies of the Nest Box Monitoring Data Sheets can be downloaded on the Connecting Country website ***www.connectingcountry.org.au*** under Projects/ Monitoring Program section or by contacting Connecting Country on 03 5472 1594 or info@connectingcountry.org.au

Nest box monitoring datasheet

Equipment; Clip board, data sheet/s, pen/pencil/sharpener, LED torch/headtorch, chair, mosquito repellent, warm clothing (weather dependent), spare batteries

OPTIONAL: GPS, camera

Method;

1. Travel to a specific nest box site approximately 10 minutes before official sunset time and familiarise yourself with surrounds.
2. Establish a sit and wait position within line-of-sight of the space between the nest box entrance and the host tree trunk (the entrance will be facing the tree trunk).
3. Distance between your position and the box should be reduced according to your ability to keep still and quiet during the survey period (≈ 30min.). Very quiet and still observers can sit within 2m of the tree however, larger groups will need to keep further away, up to 5m for example.
4. You should be in place, quiet and still within 15 minutes of twilight **(twilight times will generally lag sunset times by approx. 20 min.).** Local sunset times can be found readily on the internet such as http://www.weatherzone.com.au/vic/north-central/castlemaine
5. The survey should continue for a minimum of 15 minutes past dusk but for the purpose of our project, you can finish once a positive identification is achieved.
6. When movement is observed around the nest box opening, see if you can identify the animal in the natural light available by observing its shape and size (silhouettes are often great indicators of species).
7. As a final measure, turn on your torch and track the animal to identify distinguishing features. If an animal bolts for the canopy, try to resist the temptation to stand up and make a fuss (noise and movement will make these animals flighty).
8. If you have time, turn your torch off and wait for another five minutes to see whether you can spy another individual exiting (with sugar gliders it is quite likely that another will emerge after the first).

Physical address / GPS location	

Survey night ONE	**Observer/s (name)**			
	Date & time			
	Nest box no.	**Occupied?**	**Species?** (if available)	**Other notes;** (e.g. maintenance, follow-up inspection, numbers seen)
		Y N		

Survey night TWO	**Observer/s (name)**			
	Date & time			
	Nest box no.	**Occupied?**	**Species?** (if available)	**Other notes;** (e.g. maintenance, follow-up inspection, numbers seen)
		Y N		

Survey night THREE	**Observer/s (name)**			
	Date & time			
	Nest box no.	**Occupied?**	**Species?** (if available)	**Other notes;** (e.g. maintenance, follow-up inspection, numbers seen)
		Y N		

ABN: 47 539 096 184 Inc. No: A0053263V
P.O Box 437, Castlemaine, VIC. 3450.
www.connectingcountry.org.au/current-projects/monitoring-program

References

Strahan, R (The Aust. Museum). 1992 Encyclopedia of Aust. Animals - Mammals. Collins, Angus and Robertson Publishers Pty Ltd. Pymble, NSW, Australia.

Tzaros, C. 2006, *Wildlife of the Box-ironbark Country.* CSIRO Publishing, Collingwood Vic. Australia.

Triggs, B. 2004, *Tracks, scats and other traces. Revised Edition* – A field guide to Australian mammals. Oxford University Press, South Melbourne, Australia.

Connecting Country

Restoring landscapes across Mount Alexander

Funding for Connecting Country's Yellow-box Woodland project has been provided through the North Central Catchment Management Authority from the Australian Government's Caring for our Country and the State Government's Natural Resource Investment Program.

The Norman Wettenhall Foundation

Friends of the Box-Ironbark Forests (Mount Alexander Region)

CARING FOR OUR COUNTRY

Victoria Department of Sustainability and Environment

NORTH CENTRAL Catchment Management Authority

Connecting Rivers, Landscapes, People

www.connectingcountry.org.au

Connecting Country 5472 1594