HFNC Beear State Forest fauna nest box report, 26 Nov. 2023

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Background

On 20-21 April 2012 ten nest boxes were installed at Sites 2, 3, 5, 6 & 10 (pairs of a large and a small box) in the Beear SF. Boxes were moved from Sites 6 & 10 to Sites 14 & 15 in April 2014.

John Burtonclay from Mandurang constructed the boxes (www.nestboxenvironest.com)
The fauna nest boxes were of 2 types, both with a 40 mm entry hole at the front:

- Tuan/Glider box – 370 mm x 197 mm x 235 mm internal spaces (H x W x D), with top-hinged lid.
- Bush box – 271 mm x 195 mm x 157 mm internal spaces (H x W x D), with side opening.

The aim was to survey small mammals, hopefully including Brush-tailed Phascogale, Sugar Glider, Pygmy Possum and *Antechinus* spp. Boxes were sited in pairs 10-20 m apart to allow Brush-tailed Phascogales the chance to use a box in areas where the dominant Sugar Gliders were present (gliders may not allow another glider family to live close by but might allow phascogales to do so).

Bees were initially a problem in 3 of the large nest boxes. In May 2013 bees and honey was removed from the 3 boxes and wool carpet was stapled on the upper walls and under the lid (Site 2) or only under the lid (Sites 3, 5, 6/14 & 10/15) of the large boxes. Two boxes (Sites 5 & 6/14) also had a movable sheep tag flap fitted over the inside of the hole to exclude bees.

In 2015 a pole camera was acquired to view and photograph the contents of the boxes from the ground. The camera lens is inserted through the entry hole on the box. The lids of the large boxes could be lifted, using a telescopic pole, to obtain a clearer view.

Survey sites (gps data Aust. 84 system – for WGS, adjust by -5.5 secs latitude, +4.8 secs longitude)
Site 2 – 1.2 km from Beear SF sign on Hallams Tk. [37-22-34.7/142-02-24.5]
Habitat – dense *E. baxteri* forest with *X. minor* understorey (unburned >60 years).

Site 3 – 2.7 km from Beear SF sign on Hallams Tk. [37-21-45.8/142-02-2.1]
Habitat – a valley with *E. leucoxylon*, *E. melliodora*, *E. viminalis*, *E. baxteri*, *B. marginata*.

Site 5 – west of fire dam on track to McAdams Rd, in a flat. [37-21-20.0/142-01-30.2]
Habitat – *E. melliodora*, *E. baxteri*, *B. marginata*, *A. mearnsii* and *X. Minor* and many logs.

[Site 6 – 0.9 km on 2011 Burn Tk from jn 2011 Burn Tk/McAdams Tk. [37-20-51/142-01-40]
Habitat – *E. leucoxylon & E .baxteri* and *X. minor* in an area partially burned in 2011.

[Site 10 – 0.7 km N on Hallams Tk from McAdams Tk jn, then 250 m west. [37-20-50/142-02-12]
Habitat – *E. leucoxylon*, *E. melliodora*, *E. viminalis* & *B. marginata* open woodland with *X. minor*.

Site 14 – 1.3 km N on Hallams Tk from McAdams Tk jn. [37-20-32.3/142-02-30.8]
Habitat – *E. leucoxylon & E. melliodora* open woodland

Site 15 – 1.9 km on Hallams Tk from McAdams Tk jn. [37-20-32.1/142-02-47.6]
Habitat – *E. leucoxylon* open woodland adjacent to *E. baxteri* forest & *E. camaldulensis* creek line

Inspection of mammal nest boxes on 26 Nov 2023

Sugar gliders were found in 2 large boxes (Sites 2 & 14). Bees were present in the large box at Site 5 that was occupied by bees in 2021 and 2022. One small box at Site 2 had decayed and fell when inspected – it had skeletal remains of a Sugar Glider in dead leaves. A large box at Site 15 that had fallen from the tree in 2021, repaired and then reset, has decayed and is no longer used. It remains on the tree.

Site 2:
Large box – green leaves were present and 3 Sugar Gliders were seen.

Small box – dead leaves and dry remnant of a Sugar Glider found in the box that had decayed and fell from the tree.

Site 3:
Large box – a repaired box (new lid and fixtures) was reinstated at this site.

Small box – dead leaves were seen but no animals.

Site 5:
Large box – camera not used as bees were present, as in Nov. 2021 & 2022.

Small box – remnants of old honeycomb were seen but no animals.

Site 14:
Large box – green leaves and at least 1 Sugar Glider were present

Small box – there were a few dead leaves present but no animals.

Site 15:
Large Box – a few dead leaves were present but the lid has decayed and the box appears to be unusable.

Small Box – a few dead leaves present but no fauna.

Some conclusions to date on the longevity of the nest boxes

After 12 years it seems that our nest boxes are beginning to fail. The problem is the decay of the wood, leading to water entering the box and/or failure of the mounting to secure the box to the tree. A study by Bendigo FNC of 303 nest boxes in the Greater Bendigo NP found that 60% of nest boxes remained functional after nearly 20 years. That study found that securing the box to the tree by nailing through a backboard was inferior to suspending the box from a nail in the tree. Oddly, boxes on Red Ironbark lasted much longer than those on Yellow Box.

Our boxes were made from 5 or 6-ply wood and painted. While the boxes were solidly constructed the wood has failed. Marine ply or solid hardwood may have been better. It may be that a wider lid, perhaps with a metal or damp-course outer layer, would provide better protection for the box. Alternatively, recycled plastic 'board', if acceptable to mammals, should be less affected by weather and decay. HFNC might investigate a different material for comparison?

The occupancy of small boxes (7 records) was inferior to that of the large boxes (19 records). For that reason, and the ability to open the lid of the large box when inspecting the contents from the ground using a pole camera, we would not persist with the small boxes.

Bees have re-emerged as a problem. At Site 5, where carpet had been fitted under the lid and a bee-excluder flap fitted behind the entry hole, bees have invaded and have persisted over several years. We have not investigated the reason for the failure, hoping that the bees would leave.

We have not observed any Brush-tailed Phascogales in this survey. That is disappointing. *Antechinus flavipes* have not used the boxes either (a dead individual was found on the ground in 2022).

Unless we replace defunct boxes with more serviceable types it is probably not the best use of our time/effort to continuing monitoring the diminishing number of functional boxes.

Other Fauna seen at or between sites

Mammals – Eastern Grey Kangaroo, Red-necked Wallaby, Black Wallaby.

Birds – Australian Magpie, Grey Currawong , Sulphur-crested Cockatoo; Yellow-tailed Black-cockatoo (feeding on Silver Banksia cones), Spotted Pardalote.

Table 1. Occupation of mammal nest boxes in the Beear State Forest over 12 years (2012 to 2023)

			2012	2013		2014		2015	2016	2017	2018	2019	2020	2021	2022	2023	
Site	Box	Contents	20/11	7/5	19/11	20/4	25/11	21/11	20/11	25/11	18/11	23/11	29/11	27/11	17/11	26/11	
2	Large	Bees	Yes, S	C,L&W	nil	nil	nil	nil	nil	nil	nil	nil	nil	@	nil	nil	
		Leaves	-	-	G	G	G	G	G	-	G	G	G	G	G	G	
		Gliders	nil	nil	2+	nil	nil	2+	2+	nil	nil	nil	2+	2-3?	nil	3	
	Small	Bees	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	ǂ	
		Leaves	-	-	-	-	-	-	G	D	G	G	D	G,D	G	D	
		Gliders	nil	nil	nil	nil	nil	nil	?	nil	nil	nil	nil	nil	nil	1 skel	
3	Large	Bees	nil	C L	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	-	
		Leaves	-	-	G	G	G	G	G	G	G	G	D	G,D	D	-	
		Gliders	nil	nil	2+	nil	nil	2+	3+	1+	nil	nil	nil	nil	nil *	-	
	Small	Bees	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	
		Leaves	-	-	G	D	D	G	G	-	G	-	D	D	G	D	
		Gliders	nil	nil	nil	nil	nil	nil	?	nil	6 (4j)	nil	nil	nil	nil	nil	
5	Large	Bees	Yes, S	C L, F	nil	nil	nil	nil	nil	nil	nil	nil	nil -	yes	yes	yes	
		Leaves	-	-	G	-	-	-	-	-	G	G	G	-	-	-	
		Gliders	nil	nil	nil	nil	nil	nil	nil	?	5+	nil	3+	-	-	-	
	Small	Bees	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	h	
		Leaves	-	-	-	-	-	-	-	G	G	G	G	G	G	-	
		Gliders	nil	nil	nil	nil	nil	nil	nil	3+	nil	nil	nil	1+	nil	nil	
6#	Large	Bees	Yes, S	C L, F													
		Leaves	nil	nil	nil	nil											
		Gliders	nil	nil	nil	nil											
	Small	Bees	nil	nil	nil	nil											
		Leaves	-	-	-	-											
		Gliders	nil	nil	nil	nil											
10#	Large	Bees	-	C L	-	-											
		Leaves	-	-	-	-											
		Gliders	nil	nil	nil	nil											
	Small	Bees	nil	nil	nil	nil											
		Leaves	-	-	-	-											
		Gliders	nil	nil	nil	nil											
14	Large	Bees		C L, F			nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	
		Leaves					-	-	G	G	G	G	G	D	G	G	
		Gliders					nil	nil	2+	1+	4(3j)	2+	nil	nil	nil	1+	
	Small	Bees					nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	
		Leaves					-	-	G	D	G	G	G	G	G	^D	
		Gliders					nil	nil	nil	nil	nil	nil	1+	nil	nil	nil	
15	Large	Bees		C L			nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	
		Leaves					-	-	-	G	G	G	D	D	G	^D	
		Gliders					nil	nil	nil	2+	nil	4(2j)+	nil	nil ǂ	nil	+	
	Small	Bees					nil	nil	nil	nil	nil	nil	nil	nil	nil	nil	
		Leaves					-	-	-	-	G	G	G	D	D	^D	
		Gliders					nil	nil	nil	nil	2+	nil	3+	nil	nil	nil	

C, L&W = honeycomb removed and carpet (C) stapled to underside of lid (L) & upper parts of walls (W)
C, L = honeycomb removed and carpet stapled to underside of the lid (L)
F = honeycomb removed and a movable ear-tag flap (F) was screwed to the inner side of entry hole
S = the box was sprayed with an insecticide to kill bees and the honeycomb was removed
# = on 24 April 2014 boxes from Sites 6 & 10 were shifted to Sites 14 & 15, respectively.

G = green-tinged (fresh) leaves; D = older, 'dead' leaves
j = number of juvenile Sugar Glider included
@ = remnant of honeycomb (no honey) seen on the carpet attached to the underside of the lid
ǂ = box dislodged and lid off
* Box fallen and decayed lid broken; removed for repairs, to be replaced next Nov
skel = skeletal remains (skull and fur) amidst decayed dead leaves
h = remnants of old honeycomb present
^ = a few
+ = lid decayed and box inoperative