

Pacific Highway Upgrade: Woolgoolga to Ballina, Sections 1 and 2

Microbat and Nest box Monitoring –
Operational Phase, (2020-2021)



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Cover Photo: Stephens` banded snake (*Hoplocephalus stephensii*) occupying a small parrot box at section 2.

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1. Introduction

Woolgoolga to Glenugie (W2G) extends 31 km north of the Sapphire to Woolgoolga Pacific Highway upgrade (S2W), and forms sections 1 and 2 of the Woolgoolga to Ballina (W2B) Pacific highway upgrade. The two sections include:

- Section 1 - Woolgoolga to Halfway Creek (W2HC) extends from the northern limit of the Sapphire to Woolgoolga Pacific Highway upgrade north 14 kilometers to Halfway Creek.
- Section 2 – Includes the Halfway Creek to Glenugie (HC2G) Upgrade and Wells Crossing to Glenugie (WC2G – 2A) upgrade. The combined HC2G and WC2G upgrades extend 12.3 km from the northern end of WC2HC to the southern end of the Glenugie Upgrade at Franklins Road.

1.1 Background

1.1.1 Nest boxes

The Ministerial Conditions of Approval (MCoA) for W2B required the preparation of a Nest Box Management Plan (NBMP) to assist in managing displacement of hollow-dependent fauna (MCoA D6). A NBMP was developed for section 1 (Biosis 2014) and section 2 (Ecosure 2014). An addendum to the section 2 NBMP for the WC2G project was developed by Transport for New South Wales (TfNSW) for the WC2G project (section 2A) and approved in 2019 (TfNSW 2019). The respective NBMPs (sections 1, 2 and 2A) outlined the number of hollow-bearing trees (HBT) and the total number and size characteristics of hollows within the clearing boundary (Biosis, 2014; Ecosure, 2014; Transport 2019). These figures were used to calculate the type and number of nest boxes to be installed to provide supplementary habitat for fauna displaced during clearing. As per NBMP calculations, 171 nest boxes were installed at section 1 between November 2015 and September 2016. In section 2, 249 nest boxes were installed between May 2015 and September 2016 with an additional 3 boxes installed in section 2A in 2019. Fifty-two artificial chainsaw hollows were also installed in section 2A as an alternative option to nest boxes.

The NBMPs also detailed the timing of construction and operational phase nest box monitoring events. As specified in the relevant NBMP, construction monitoring was conducted during 2016-17 in section 1 (Sandpiper, 2017) and section 2 (Ecosure, 2017). Construction surveys at section 1 (Sandpiper, 2017) found:

- Evidence of use of nest boxes ranged from 30.1% to 56.4%;
- 36% of hollow dependent species displaced during clearing were recorded using nest boxes;
- Two threatened species, squirrel glider and brush-tailed phascogale, were recorded using nest boxes;
- No exotic fauna were recorded using nest boxes; and
- Minimal repairs were required.

Section 2 construction monitoring found 30% of boxes showed evidence of use with one box containing a pair of squirrel gliders (Ecosure, 2017). Monitoring of chainsaw hollows was not undertaken during construction, with the first inspections scheduled for spring 2020 and autumn 2021 during the operational phase.

1.1.2 Microbats

During pre-construction surveys threatened microbats (Little bent-winged bat – *Miniopterus australis*, Eastern bent-wing bat *Miniopterus schreibersii* and Large-footed myotis – *Myotis macropus*) were found using drainage structures within the project boundary of sections 1 and 2 (Geolink, 2014). The presence of threatened microbats triggered the requirement for a Project Specific Microbat Management Plan (Geolink, 2014). The Microbat Management Plan (MMP) aimed to reduce the risk of injury/death to microbats during construction works and provide temporary (during construction) and permanent (during operation) habitat adjacent to and within impacted drainage structures. In accordance with the MMP, microbat boxes were installed as temporary habitat at five impacted drainage structures noted as having medium to high value microbat habitat (Geolink, 2014). In addition to bat boxes, habitat design features (i.e. culvert joins >20mm) were installed in drainage structures to provide permanent microbat habitat. Three structures were also monitored as control sites.

Construction phase monitoring conducted in 2015-2016 and 2017 recorded large-footed myotis using boxes attached to the Halfway Creek bridge (Ecosure, 2017; Sandpiper, 2018a). Bent-winged bats (*Miniopterus sp.*) were recorded at two impact sites, including the Bebo arch at Glenugie Creek and an old box culvert located to the north of Glenugie Creek, and at two control sites (box culverts) within the old Halfway Creek section of highway (Ecosure, 2017). Long-eared bats (*Nyctophilus spp.*) were the only genera recorded using bat boxes installed in habitat adjoining impacted culverts (Sandpiper, 2018a). Following construction works, bat boxes from the adjacent habitat not utilised by microbats were moved into impact drainage structures as additional habitat features.

1.2 Scope of works

Sandpiper Ecological Surveys was contracted by Transport for New South Wales (TfNSW) in July 2020 to undertake operational phase monitoring of nest boxes and microbat drainage structures for sections 1 (W2HC) and 2 HC2G /WC2G. The proposed monitoring and maintenance schedule with the relevant management plan is presented in Table 1.

Table 1: Scheduled and completed operational monitoring and maintenance plan for sections 1 and 2, including the number of structures and boxes to be inspected. CS = Chainsaw hollows. NB = Nest boxes. MB =Microbat. NBMP = Nest box management plan. MBMP = Microbat management plan.

Plan	Section	CS hollows	NB	MB Structures	MB boxes	Completed	Remaining
NBMP (Biosis 2014)	1	-	171	-	-	Operational 2020-2021 ✓	Operational 2023
NBMP (Ecosure 2014)	2	-	249	-	-	Operational 2020-2021 ✓	Operational 2023
NBMP (TfNSW 2019)	2A	52	3	-	-	Operational 2020-2021 ✓	Operational 2023
MBMP (Geolink 2014)	1	-	4	11		Operational 2020-2021 ✓	Operational 2023
MBMP (Geolink 2014)	2	-	4	19		Operational 2020-2021 ✓	Operational 2023

The following report presents the first year of operational phase monitoring of nest boxes, microbat roosting structures and chainsaw hollows (Table 1). The report details background information on the installation process, inspection methods and results of the nest box and microbat inspections. Findings are then discussed in the context of the performance measures as specified within the relevant NBMPs (Biosis, 2014; Ecosure, 2014; Transport, 2019) and MBMP (Geolink, 2014) in addition to literature and previous highway monitoring projects.

2. Methods

2.1 Design and installation

2.1.1 Nest boxes

Prior to installation in section 1 the box types proposed were reviewed and issues discussed with TfNSW (formerly Roads and Maritime Services) regarding the allocation of boxes to common planigale (*Planigale maculata*) and eastern pygmy possum (*Cercartetus nanus*). It was agreed that boxes designated for common planigale would target feathertail glider (*Acrobates* spp), *Antechinus* spp and microbats, whilst the eastern pygmy possum boxes would target that species if suitable habitat was present but would otherwise target the aforementioned species. Boxes were installed in section 2 as per the NBMP.

A total of 14 box designs constructed from various materials (plywood, metal, hardwood and cyplas) were installed at section 1 (Table 2). Boxes were installed during four periods, 5-8 May 2015 (prior to clearing), 27 and 28 August 2015 (during clearing), 10 November 2015 (during clearing) and 15, 29 and 30 September 2016 (post clearing). Locations of section 1 nest boxes are shown in Figures 1-3.

Nine nest box designs were installed at section 2 (Table 3). Initial installation occurred during May/June 2015 with the final install (post clearing) occurring in 2016. The final number, type, and dimensions of nest boxes installed is presented in Table 3. Locations of section 2 nest boxes are shown in Figures 3-4.

Table 2: Design specifications of nest boxes installed at section 1 W2HC project.

Box Type	Inside Measurements (mm)	Chamber Depth (mm)	Entrance Diameter (mm)	Box Material				Total Boxes
				Plywood	Metal	Hardwood	Cyplas	
Sugar/squirrel glider	150 x 250	300	45	22	6	0	0	28
Yellow-bellied glider	250 x 350	400	80	6	2	0	4	12
Brush-tail/ringtail possum	250 x 200	300	85	6	6	2	0	14
Microbat	20 slot	400	30 hole	9	0	0	1	10
Scansorial small (Antechinus)	150 x 150	200	30	15	4	0	0	19
Scansorial small (Feathertail glider)	150 x 150	200-300	30	12	3	0	1	16
Scansorial small (Eastern pygmy possum)	150 x 150	300	30	1	1	0	0	2

Box Type	Inside Measurements (mm)	Chamber Depth (mm)	Entrance Diameter (mm)	Box Material				Total Boxes
				Plywood	Metal	Hardwood	Cyplas	
Scansorial large (Brush-tailed phascogale)	150 x 200	300	50	14	8	0	0	22
Quoll	500 x 500	800	200	4	3	0	0	7
Cockatoo	300 x 400	1200	200	4	2	0	0	6
Masked Owl	250 x 300	500	100	2	1	0	0	3
Powerful Owl	500 x 500	800	200	4	1	0	0	5
Lorikeet	150 x 150	350	55	5	3	3	0	11
Treecreeper	150 x 150	350	60	0	2	14	0	16
Total				103	42	19	6	171

Table 3: Design specifications of nest boxes at section 2.

Box Type	Entrance diameter (mm)	Chamber depth (mm)	Inside measurements (mm)	Placement height (m)	
Scansorial mammals (i.e. antechinus, brush-tailed phascogale)	30-50	200-300	150 x 200	2-6	97
Microchiropteran bats (fluttering and direct flying species)	Horizontal slot 20	400	200 x 200	3-5	7
Small gliders (i.e. sugar glider)	30-45	300	150 x 250	3-6	23
Larger gliders (i.e. yellow-bellied glider, greater glider)	90	400	250 x 250	6-10	5
Small parrots (i.e. Eastern Rosella)	55-100	400	200 x 200	5-8	36
Possums (brush-tails and ringtails)	85 – 100	300	250 x 250	2-4	22
Small owls (boobook owl, barn owl)	100	500	250 x 300	4-6	25
Large parrots (king parrot)	200	1200	300 x 400	8-10	25
Large owls (i.e. powerful owl)	200	800	550 x 550	12-20	12
Total					252



Figure 1: Location of section 1 W2HC nest boxes (southern).

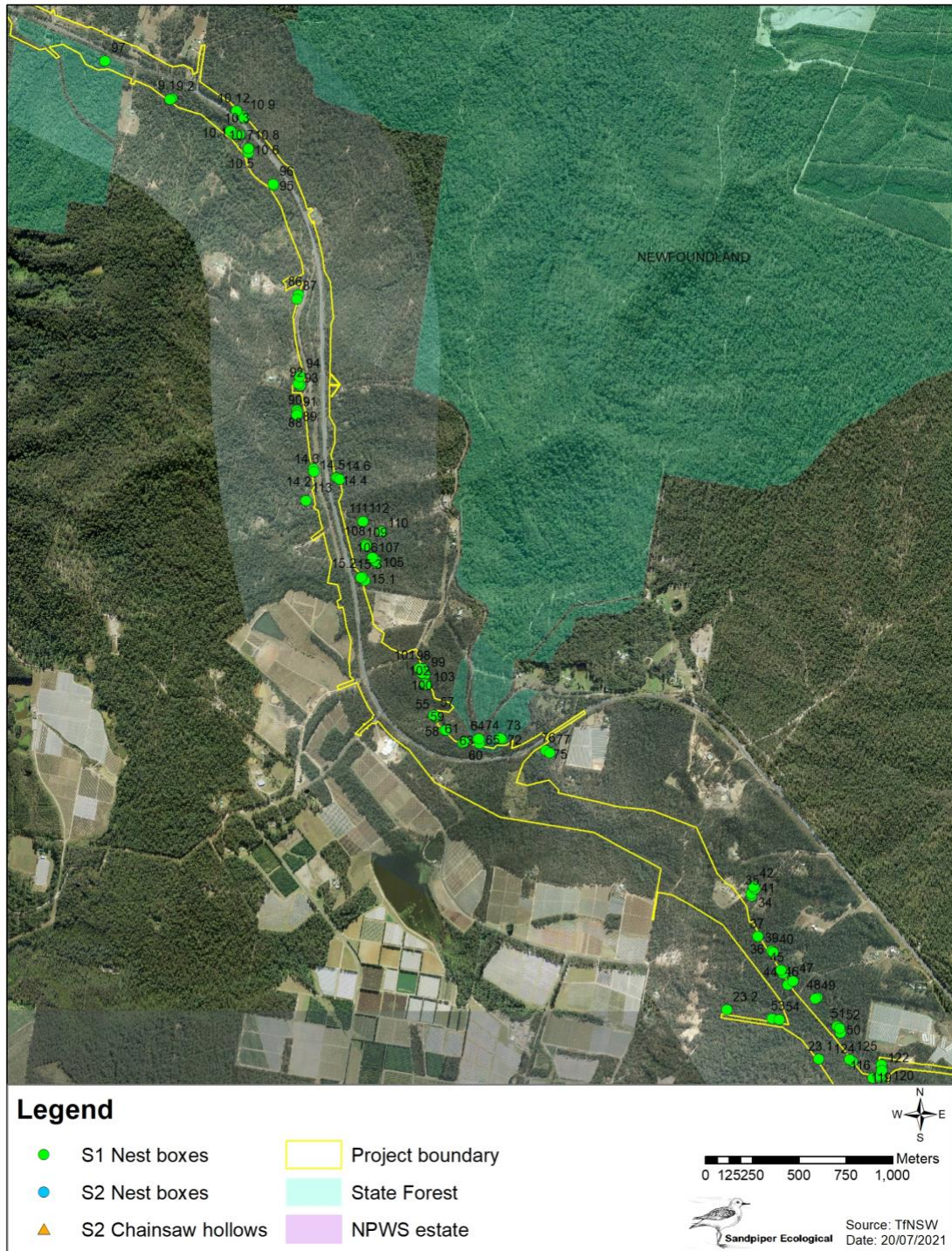


Figure 2: Location of section 1 W2HC nest boxes (middle).

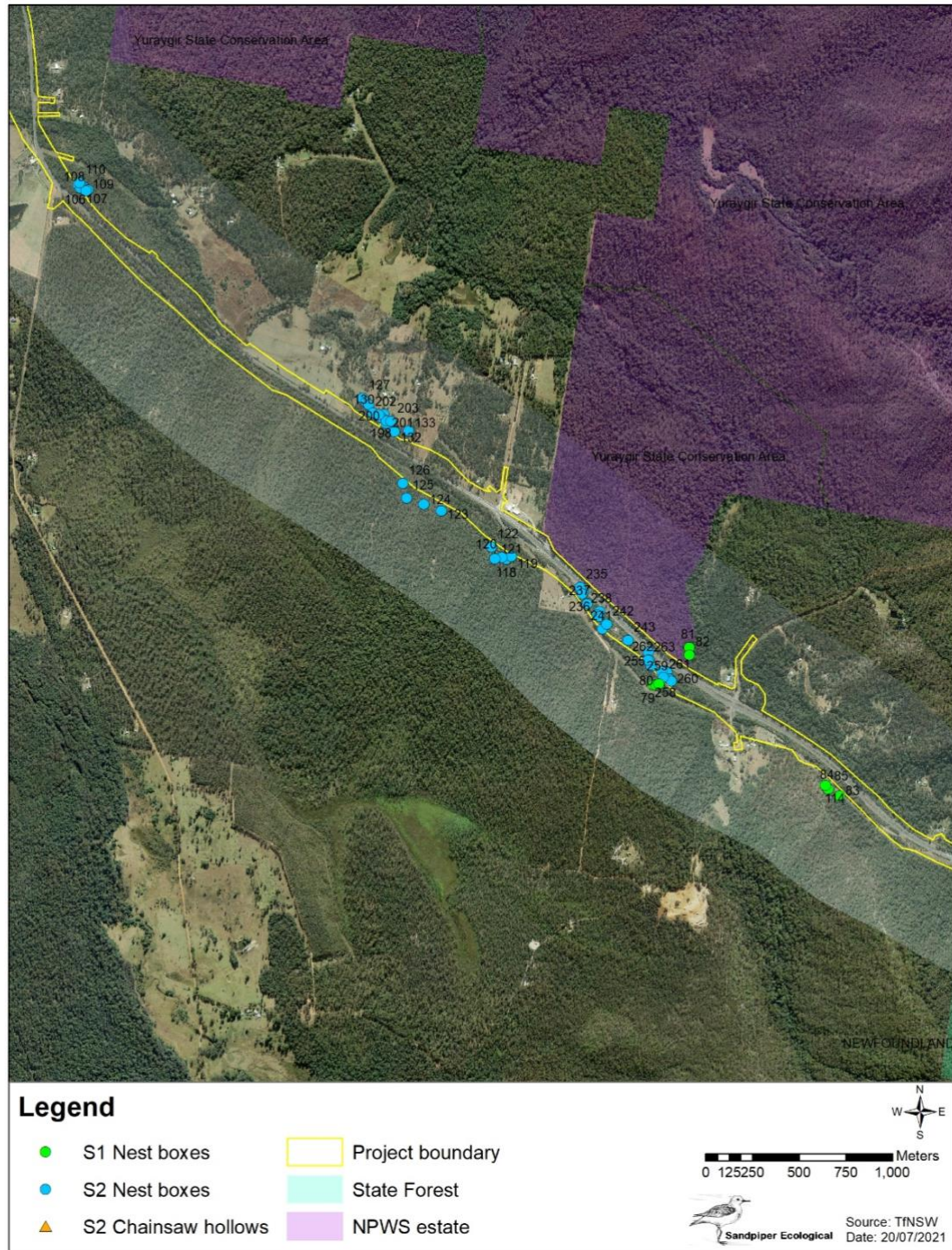


Figure 3: Northernmost section 1 nest boxes and beginning of section 2 HC2G nest boxes.

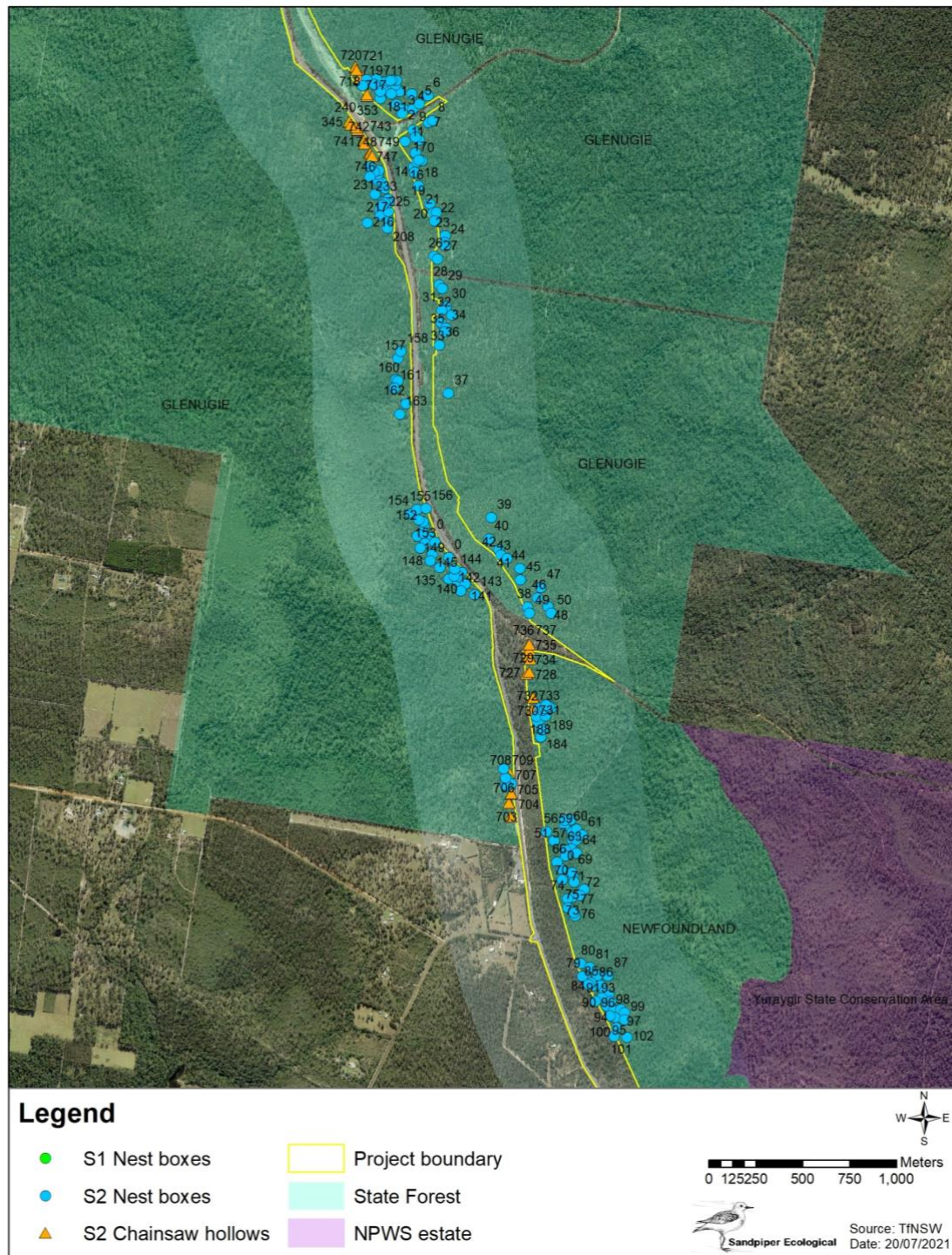


Figure 4: Section 2 HC2G and 2A WC2G nest boxes and chainsaw hollow locations (northern extent).

2.1.2 Chainsaw hollows

Four chainsaw hollow designs were installed at WC2G (section 2) during August 2019 (Table 4). Suitable host trees had a minimum diameter at breast height (DBH) of 400mm and a total tree height of 15-25m. Table 4 details the type of chainsaw hollows, dimensions and number installed. Figure 4 shows the location of installed chainsaw hollows.

Table 4: Artificial hollow specifications as per Eco Logical Australia installation W2B Section 2 (Eco Logical 2020).

Hollow types	Entrance diameter (mm)	Faceplate position	Inside measurements H x W X D (mm)
Small arboreal mammal (i.e. feathertail, antechinus)	25	Top	300 x (90-100) x (120-200)
Medium sized arboreal mammal (squirrel glider, sugar glider, brush-tailed phascogale)	45	Top	450 x (150-200) x (150-200)
Microbat small entrance	Rectangular 12 x (50-150)	Bottom	300-500 H
Microbat large entrance	Rectangular 20 x (50-150)	Bottom	300-500 H

2.1.3 Bat boxes and structures

During construction, 28 nest boxes were installed in habitat adjoining four structures, 12 at Glenugie Creek, five at Halfway Creek, two at north Boneys Creek and nine at Boneys Creek (Table 5; Sandpiper, 2017; 2018a). Ten boxes were installed within structures, including two plywood boxes beneath the Halfway Creek bridge, and eight hebel boxes within the four-cell Halfway Creek culvert. Eight structures were monitored during the construction phase, four each in sections 1 and 2 (Table 5). Structure numbers 66 and 67 were situated in the original Halfway Creek upgrade (i.e. old Pacific Highway) and are classed as reference sites, where no construction work occurred.

The intent of boxes installed in adjacent habitat was to provide supplementary roosts whilst culverts were being constructed. Upon completion of construction, eight boxes were moved from adjacent habitat into the Boneys Creek culvert, and two boxes were moved from adjacent habitat into the Boneys Creek north culvert (Table 5). Boxes in adjacent habitat at Halfway Creek and Glenugie Creek remain in-situ, except five boxes at Glenugie Creek which were removed during clearing for section 2A. Locations of culvert monitoring sites are shown in Figures 5 to 7.

Table 5: Specifications of microbat drainage structures monitored at sections 1 and 2. * = reference site.

Section	Chainage	Structure No.	Site Name	Structure type	No. of cells	Width (mm)	Height (mm)	No. boxes	Roughened concrete
1	13310	46	Boneys Creek	Box culvert & adj boxes	2	3000	3000	9 adj hab – 8 moved internal	Yes
1	13850	49	Nth Boneys	Box culvert	1	2400	2100	2 adj hab – both moved internal	Yes
1	15950	66*	Grays Rd	Box culvert	3	3300	2400	0	Yes
1	16000	67*	Grays Road nth	Box culvert	1	1200	1200	0	No
2	20665	25	H'way Ck culvert	Box culvert	4	3000	2400	5 adj hab 8 internal	Yes

W2B Sections 1 and 2 Nest Box and Microbat Monitoring

Section	Chainage	Structure No.	Site Name	Structure type	No. of cells	Width (mm)	Height (mm)	No. boxes	Roughened concrete
2	21000	25.1	H'way Ck bridge	Boxes beneath bridge	N/A			2 internal	No
2	29360	32	Glenugie Ck	Bebo arch & boxes (east side only)	1	9000	3000	12 adj hab	No
2	30160	40*	Old highway	Box culvert	2	2400	2400	0	Yes

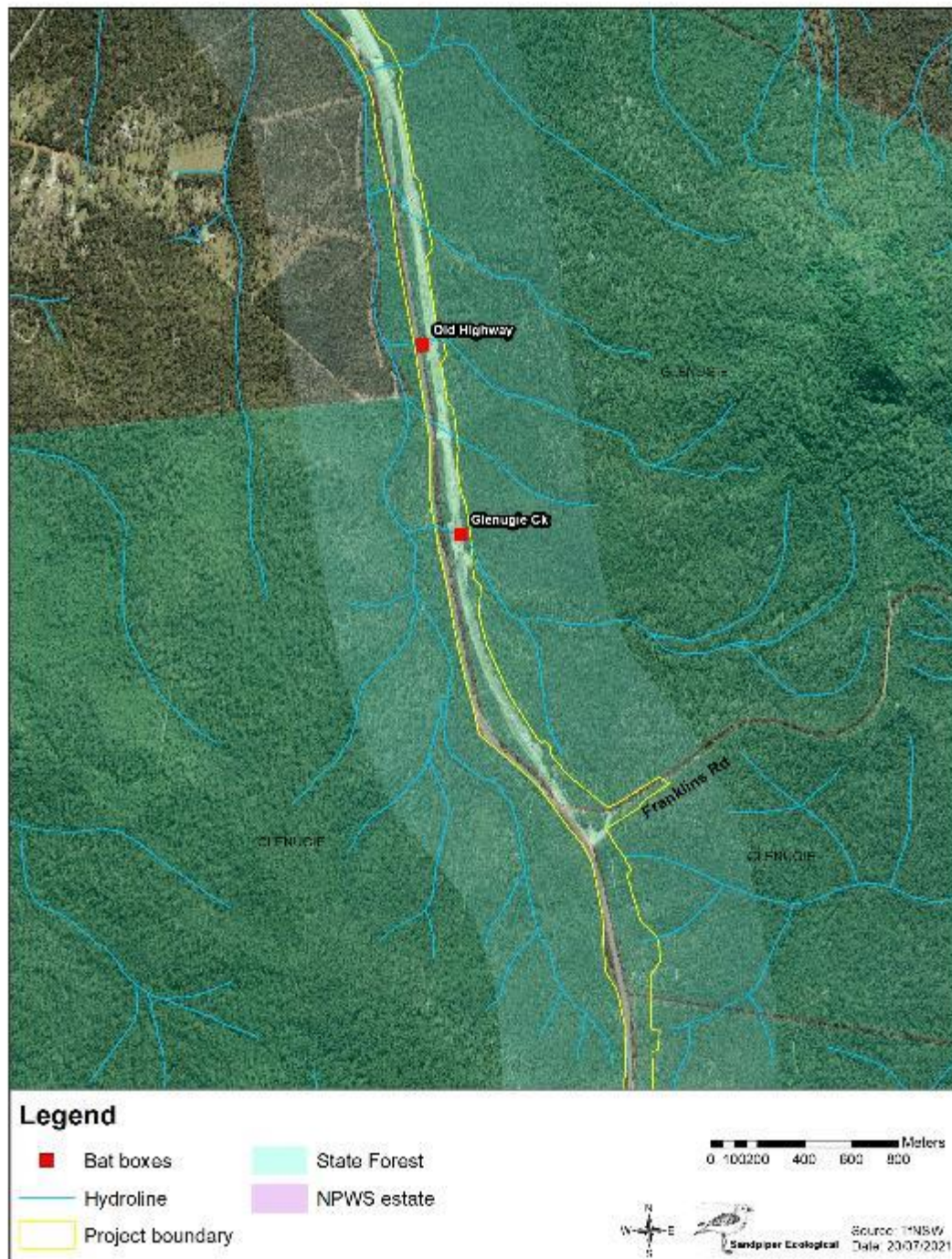


Figure 5: Locations of microbat monitoring structures at section 2 HC2G (northern extent).

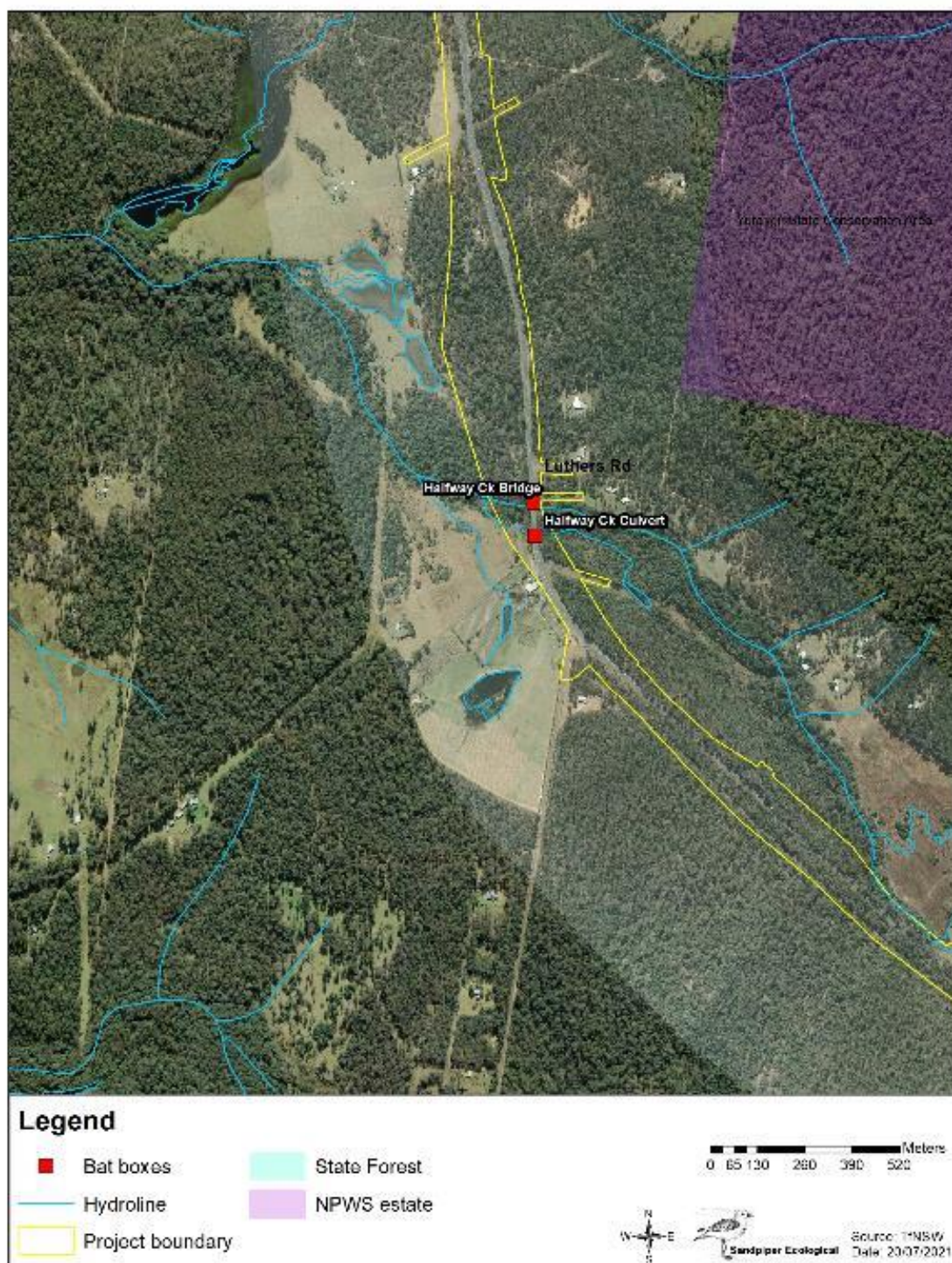


Figure 6: Locations of microbat monitoring structures at section 2 HC2G (southern extent).

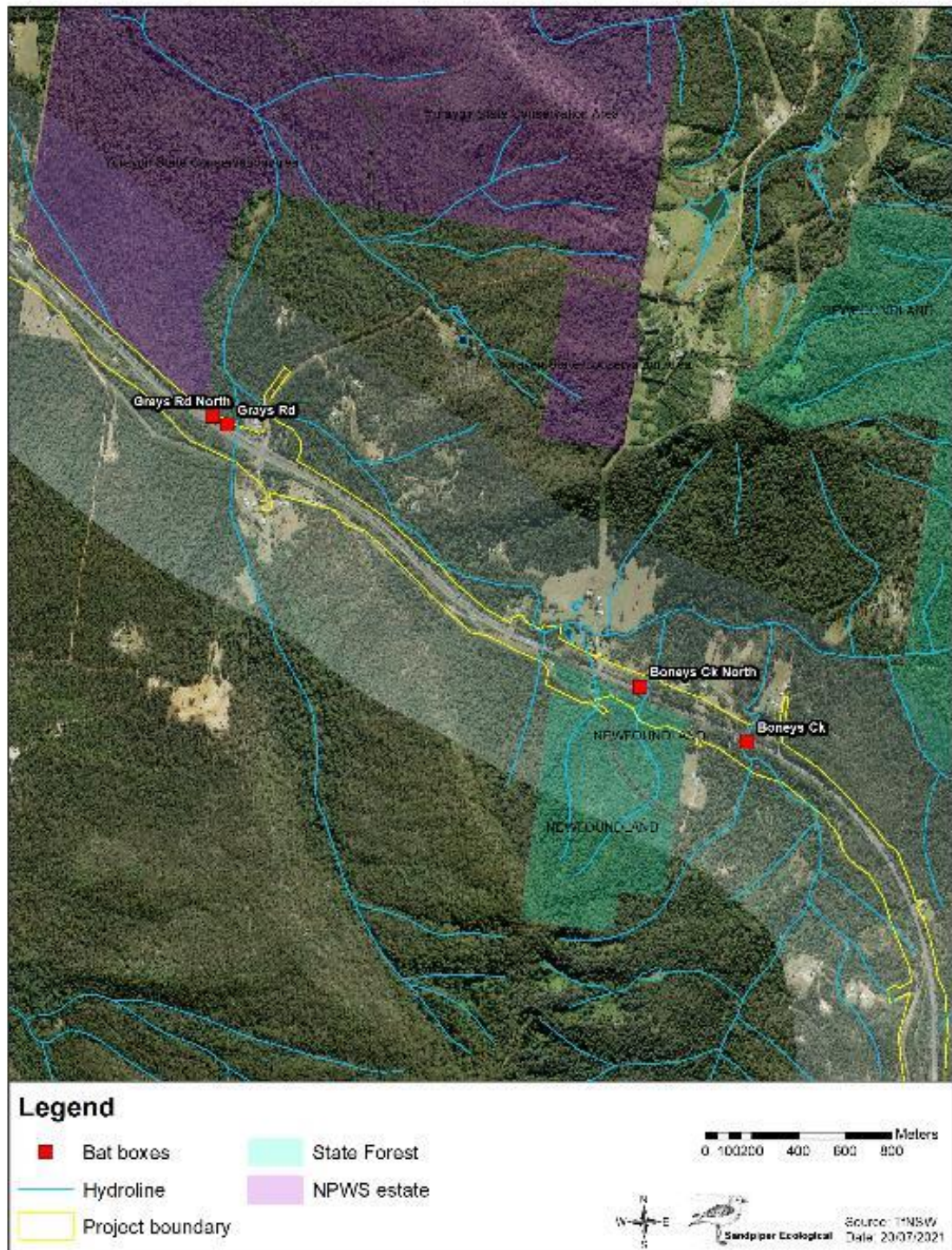


Figure 7: Locations of microbat monitoring structures at section 1 W2HC.

2.2 Nest box inspections

Sections 1 and 2 nest boxes were inspected between 9 and 30 November 2020 (spring) and 20 and 29 April 2021 (autumn) with climber boxes for the autumn survey inspected on 24-25 June 2021. During inspections nest box designs recorded in the field were checked against those recorded on the datasheet. Any discrepancies were changed. Boxes were located using a hand-held GPS and grid references supplied by TFNSW. Nest boxes were inspected using a telescopic pole with a GoPro Hero7

and Knog light unit attached. The GoPro was linked wirelessly to an iPad where an ecologist viewed the contents of each box. The lid of each box was carefully lifted, the interior photographed, and essential data recorded using a standard data sheet. Tree climbers inspected and photographed boxes higher than ten meters. Data recorded during all inspections included; weather conditions (i.e., rain, wind, cloud cover, ambient temperature), time and date of inspection, vertebrate fauna present, approximate age and number of fauna present, sex of fauna present (if discernible), fauna signs such as leaf nests, scats, wear or scratch marks, box condition, wire condition, and comments on any changes in the surrounding habitat.

Box use was determined by direct observation of fauna (i.e. occupied) or indirectly by nest characteristics and scats (i.e. evidence of use). Nests were assigned an accuracy score, which included possible (50-75% certain), probable (75-95% certain), or definite (>95%). Box condition was allocated one of three ratings: Fair (nil or very little deterioration), minor- moderate damage (hinge deterioration, box delaminating, lid fallen off, wire or spring rusting), severe damage (Non-functional i.e., box fallen, termite infestation, or burnt). Evidence of feral animal occupation such as European bees (*Apis mellifera*) was also recorded. Native beehives (*Austroplebeia* and/or *Tetragonula* spp.) were recorded in the fauna column of the datasheet.

Identification of fauna and fauna signs was based on the ecologist's experience, with reference to standard field guides (e.g. Menkhorst & Knight 2004; Churchill 2008; Tyler & Knight 2009; Triggs 1996) as required. Colleagues were consulted to identify some nests.

2.3 Chainsaw hollow inspections

Chainsaw hollows were inspected on 26 November 2020 and 3 May 2021. Hollows (n=52) were accessed via ladder and cavities inspected by an ecologist using a (Rigid) borescope. Upon inspection of the hollows, any species or evidence of use (i.e. scats, leaf nests etc) was recorded. Epicormic growth obstructing entries of the chainsaw hollows were removed during the inspection.

2.4 Bat box and structure inspections

An ecologist inspected 20 bat boxes and four culverts on 10 November 2020 (spring) and 18 May 2021 (autumn). A combination of spotlight and binoculars were used to inspect boxes, culvert joints, lift points, obverts and roughened overhangs. To avoid disturbing bats, individuals were not removed from boxes or joints unless there was concern about identification or breeding status. Data recorded at each site included: species present, number of individuals, evidence of breeding, evidence of bat use (guano and scuff marks), pest species, box condition and the amount of available roosting habitat (i.e. count of suitable joints and roughened surfaces).

2.4 Maintenance

Nest boxes that had moderate or severe deterioration were assessed to determine the best ameliorative approach. Maintenance was undertaken on 5 and 6 July 2021 with several boxes replaced in section 1 and 2 due to bush fires and damage from wire/spring failure. Replacement Cyplas boxes were reinstalled via ladder with an ecologist present. Other repairs accessible via ladder were also undertaken such as wire replacement, lid reattachment and box reinstallation.

2.5 Data summary and analysis

Nest box data for sections 1 and 2 have been summarised separately. Nest boxes considered to be used by fauna (evidence of use) contained either nests/dens (new or old), scats, remains or chew markings. Occupied boxes were recorded when fauna was directly observed within or leaving a nest box. Vacant boxes displayed no visual signs of use (as above) and were not occupied by fauna during inspection.

To assess whether species use of nest boxes was consistent with the species targeted by the nest box design, data for each section was pooled across both sample periods (spring + autumn inspections). Nest box designs in section 1 were highly specific, often targeting individual species (i.e. Masked owl and Powerful owl) despite having similar entry sizes and inner dimensions. To account for these similarities in design, section 1 boxes were reassigned into the following groups according to entry size: CO= Cockatoo/Owl (masked owl, powerful owl and cockatoo boxes), LG=Large Glider (YbG boxes), MB=Microbat, Po=Possum, Qu = Quoll, SM=Scansorial mammal (Antechinus/brush-tail phascogale/eastern pygmy possum), SG= small Glider (squirrel and sugar glider), L/T=Lorikeet/treecreeper (lorikeet and treecreeper) and FTG= feathertail glider. Box types at section 2 were not reassigned.

3. Results

3.1 Nest boxes

3.1.1 Occupancy and evidence of use rates

In section 1, the number of boxes occupied by vertebrate fauna remained consistent, ranging from 12 (7%) in spring to 15 (8.7%) in autumn (Figure 8). Section 2 nest boxes exhibited similar occupancy with 24 (9.5%) and 20 (8%) boxes occupied in spring 2020 and autumn 2021 (Figure 8). Occupancy of boxes by invertebrates was low, ranging from four (section 2 spring 2020) to seven nest boxes (section 1 autumn 2021) (Figure 8). Active ant nests accounted for the majority of invertebrate occupancy with a single record of an active European beehive in section 2 during spring (Table 6).

Evidence of use rates in section 1 were slightly higher than those of section 2 (Figure 8). In section 1, evidence of use exceeded 50% during both inspections, with 55% (95 boxes) recorded during spring and 56.7% (97 boxes) in autumn (Figure 8)., Section 2 recorded evidence of use at 49.6% (125 in total) of boxes in spring and 48.8 % (123 in total) in autumn (Figure 8). Vacancy rate was lower in section 1, ranging from 26.9% (46 boxes) in spring to 23.8% (41 boxes) in autumn (Figure 8). Whereas in section 2, 37.6% (95 boxes) and 35.7% (90 boxes) of nest boxes were recorded as vacant during spring and autumn, respectively (Figure 8). Notably, in both sections, the number of vacant boxes decreased between spring 2020 and autumn 2021 (Figure 8).

Twelve nest boxes were not inspected during either sample at section 1 (Figure 8) due to denied private property access (3 boxes), burnt during bushfires (7), wire failure/box on ground (2) (see Appendix A, Table A1). Also, thirteen boxes in section 2 were not inspected during spring 2021 due to wire failure (1), burnt (9) and missing (3) (see Appendix B, Table B1).

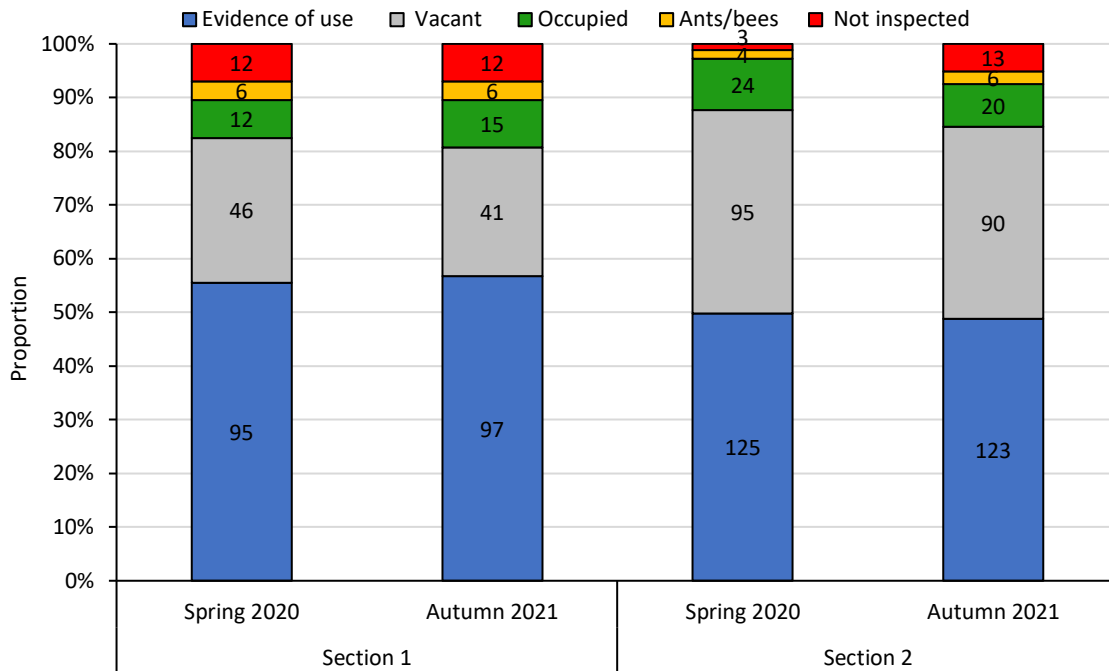


Figure 8: Number and proportion (%) of boxes used by vertebrate fauna (occupied or evidence of use), invertebrates (grouped ants and European bees), unused (vacant) and boxes not inspected (due to restricted access, damage or missing) during operational phase monitoring (spring and autumn) at W2HC (Section 1) and HC2G/WC2G (Section 2), 2020-2021.

Eleven species and four genera of vertebrate fauna were recorded using nest boxes in sections 1 and 2 (Table 6). Arboreal mammals were the most prevalent (evidence of use and occupied) fauna group in both sections (Table 6). Of the mammals recorded, small *Petaurus spp.* (i.e., sugar glider – *P. breviceps* or squirrel glider – *P. norfolcensis*) were the most frequently recorded group during spring and autumn in both sections (Table 6, Plate 1). Other mammals recorded included *Trichosurus spp.* (i.e. combined short-eared brushtail possum – *T. caninus*, and common brushtail possum – *T. vulpecula*), *Antechinus spp.*, *Acrobates spp.*, brush-tailed phascogale (*Phascogale tapoatafa*), yellow-bellied glider (*Petaurus australis*), microbat spp. and rodent spp. (Table 6, Plate 1). Records of *Trichosurus spp.* were higher in section 2 while *Acrobates spp.* were more frequently recorded in section 1 (Table 6, Plate 1).

Table 6: The number of nest boxes occupied or displaying evidence of use by species and fauna groups during autumn and spring operational monitoring at sections 1 and 2, 2020-2021. Fauna in bold denote threatened species. Old leaf nests were characterised by lack of structure and decaying leaf material. * Probable records based on den material present.

Species	Section 1				Section 2			
	Evidence of use		Occupied		Evidence of use		Occupied	
	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
Mammals								
<i>Antechinus spp.</i>	18	23		2	18	27		
Brush-tailed phascogale		1*			9*	6*		
Sugar glider				5			1	
Squirrel glider			5	4			2	2
Yellow-bellied glider						1	1	1
<i>Small Petaurid spp.</i>	42	36	2	2	48	36		1
<i>Acrobates spp.</i>	15	14			4	7		
Common brushtail possum			2	2			12	8
<i>Trichosurus spp.</i>	11	10	1		23	25		
Microbat spp.					1	1		

Species	Section 1				Section 2			
	Evidence of use		Occupied		Evidence of use		Occupied	
	Spring	Autumn	Spring	Autumn	Spring	Autumn	Spring	Autumn
<i>Rodent spp.</i>						1		
Reptiles								
Stephens' banded snake							1	
Lace monitor							1	6
Birds								
Australian owlet nightjar			1		1	7	6	1
White-throated treecreeper					1*	1*		
Treecreeper spp.	2	1			2	2		
Scaly-breasted lorikeet			1					
<i>Trichoglossus</i> spp. (lorikeet)		1						
Bird spp.					3			
Frogs								
<i>Litoria peronii</i>								1
Invertebrates								
Ants			6	6			3	6
European bees							1	
Other								
Old leaf ^A	7	9			13	8		

Birds were the next most abundant fauna group (Table 6). Australian owlet nightjar (*Aegotheles cristatus*) and treecreeper spp. were recorded in both sections (Table 6). White-throated treecreeper (*Cormobates leucophaea*) was recorded in section 2 and scaly-breasted lorikeet (*Trichoglossus chlorolepidotus*) and lorikeet spp. in section 1 (Table 6). No owls or cockatoo species were recorded using nest boxes.

Other vertebrate fauna groups recorded were reptiles (two species) and frog (one species) at section 2 (Table 6). Lace Monitor (*Varanus varius*) was recorded on seven occasions while Stephens' banded snake and Peron's tree frog (*Litoria peronii*) were each recorded in one box only (Table 6).

Notably, four threatened species were recorded, including squirrel glider, yellow-bellied glider, brush-tailed phascogale and Stephens' banded snake (Table 6). Squirrel glider (see plate 1) were recorded occupying five and four nest boxes in spring and autumn respectively in section 1 and two boxes during spring and autumn in section 2 (Table 6). An adult and juvenile yellow-bellied glider were recorded using a plywood large parrot box in spring 2020 (remnant leaf nest remained during autumn inspection) and an aluminum large parrot box in autumn 2021 (Table 6, Appendix B, Table B1 and B2). Probable evidence of use by brush-tailed phascogale (indicated by scat deposits amongst shredded bark see plate 1) was recorded in a nest box in section 1 during autumn 2021 and nine and six nest boxes in spring and autumn respectively in section 2 (Table 6). A Stephens' banded snake was recorded using a small parrot box in section 2 during spring 2020 (Table 6).



Plate 1: Fauna recorded during the spring 2020 and autumn 2021 nest box inspections. (a) Scaly-breasted lorikeet chicks, (b) Typical small petaurid (sugar or squirrel glider) leaf nest, (c) Squirrel gliders (n=2) in a small glider box in section 2, (d) Stephens' banded snake recorded in a parrot/lorikeet box in section 2, (e) scat and shredded bark in a scansorial box indicating a probable brush-tailed phascogale record, and (f) two yellow-bellied gliders using a plywood large parrot box in section 2.

3.1.2 Nest box designs and target species

Across spring 2020 and autumn 2021 inspections at section 1, five (55.5%) of the nine nest box types recorded use by the target species/groups (Figure 9). Small glider (SG) boxes recorded the highest use by a target species with 46.5% of the total SG boxes inspected (i.e. 58 boxes) showing evidence of use or occupancy by small gliders (sugar glider or squirrel; Figure 9). Feathertail glider boxes (FTG) recorded usage of 34.3% of boxes by target species (*Acrobates* spp) (Figure 9). Possum (Po) boxes recorded 28.5% usage by possums (short-eared brushtail possum, common brushtail possum, common ringtail possum and *Trichosurus* spp.; Figure 9). Other targeted fauna included *Antechinus* spp in 23.7% of scansorial fauna (SM) boxes, *Trichoglossus* spp and treecreeper spp. recorded evidence of use in 1.8% of Lorikeet/treecreeper (L/T) boxes. No use by target species was recorded in the cockatoo/owl, large glider, microbat or quoll boxes in section 1. Several species were recorded in non-design specific box types (Figure 9). Small gliders were the most widespread and were recorded using all box types except quoll and microbat with a preference for boxes with smaller entrance diameters and internal dimensions (e.g. SG, L/T, FTG and SM) (Figure 9). Scansorial fauna (*Antechinus* spp.) were predominantly recorded in smaller entrance diameter designs, although they also used large glider and possum boxes (Figure 9). Possums were recorded in four box types, all with larger entrance holes (Figure 9). Among the bird species, Australian owlet-nightjars (“lorikeet/bird” category in Figure 9) were detected in SG and CO while lorikeet spp and scaly-breasted lorikeets were recorded in the SG design (Plate 1; Figure 9). A probable brush-tailed phascogale nest was found in a large glider box (Figure 9). Non-target arboreal ants were detected in four of the nine box designs all of which had small diameter entrances (Figure 9). Higher vacancy rates were evident in MB, Qu, Po, LG and CO boxes in comparison to smaller entry sized boxes SG, L/T, FTG and SM (Figure 9).

Similarly, in section 2 five (55.5%) of the nine nest box types recorded use by the target species/groups (Figure 10). Small glider (SG) closely followed by scansorial mammal boxes (SM) recorded the highest use by target species with 23.9% (records of either feathertail, sugar or squirrel glider) and 23.7% (*Antechinus* spp. or brush-tailed phascogale records) respectively (Figure 10). Other box types used by targeted fauna included microbat with microbat scat under 14.3% of boxes, possum boxes recorded 13.6 % usage by possums (short-eared brushtail possum, common brushtail possum and *Trichosurus* spp.) while 6% of small parrot boxes (bird boxes) were used by Australian owlet nightjar (Figure 10). No use by target species was recorded in the large glider, large owl, large parrot and small owl boxes. Large gliders (yellow-bellied gliders) were recorded using large parrot boxes, while the remaining target species (large parrots, small and large owls) were not recorded.

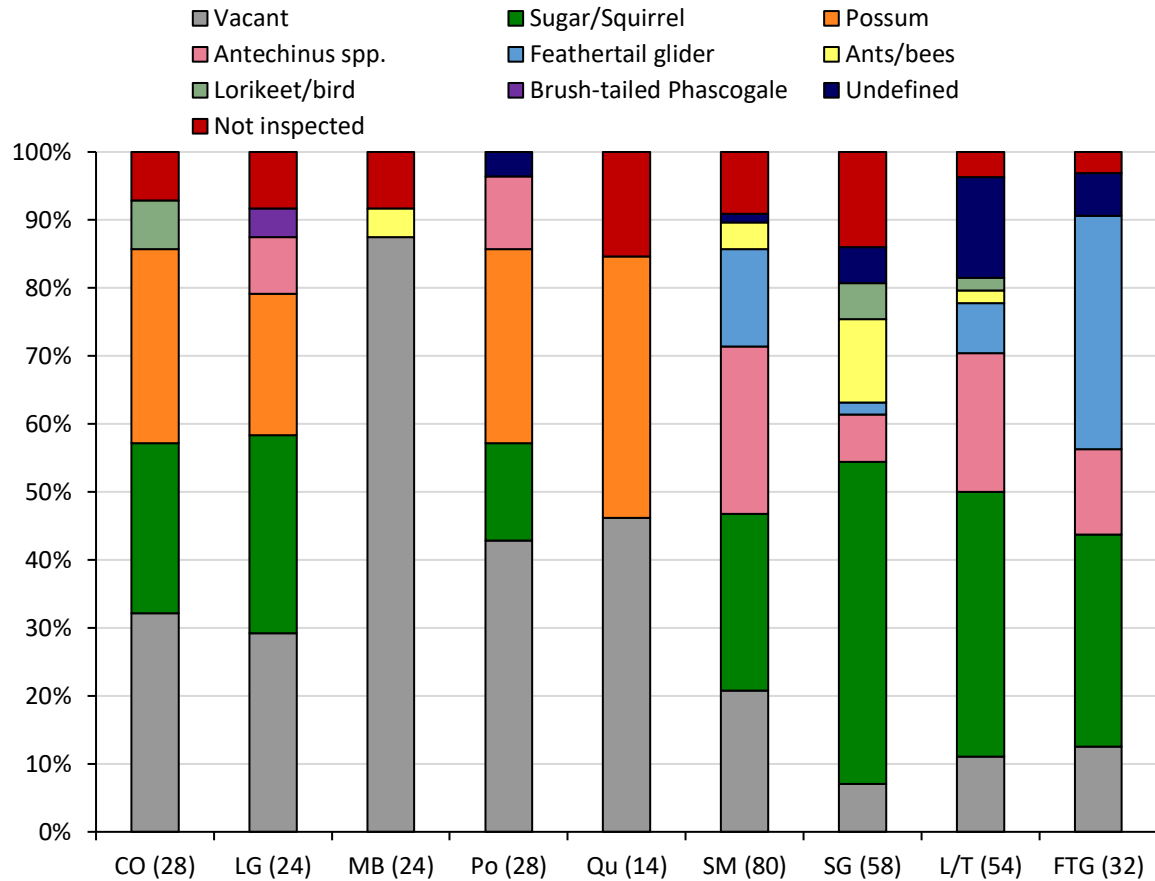


Figure 9: Fauna recorded using design-specific box types during nest box monitoring (2020-2021) at HC2G (section 1 only). Numbers in parenthesis indicate the total number of boxes inspected over the two sample periods. Fourteen nest box types were used at HC2G. For simplicity, nest boxes types have been grouped into the following according to entry sizes: CO= Cockatoo/Owl (masked owl, powerful owl and cockatoo), LG=Large Glider (YbG), MB=Microbat, Po=Possum, Qu = Quoll, SM=Scansorial mammal (Antechinus/Brush-tail phascogale/eastern pygmy possum), SG= small Glider (squirrel and sugar glider), L/T=Lorikeet/treecreeper (lorikeet and treecreeper) and FTG= feathertail glider. Undefined = remnant nest material or chew markings.

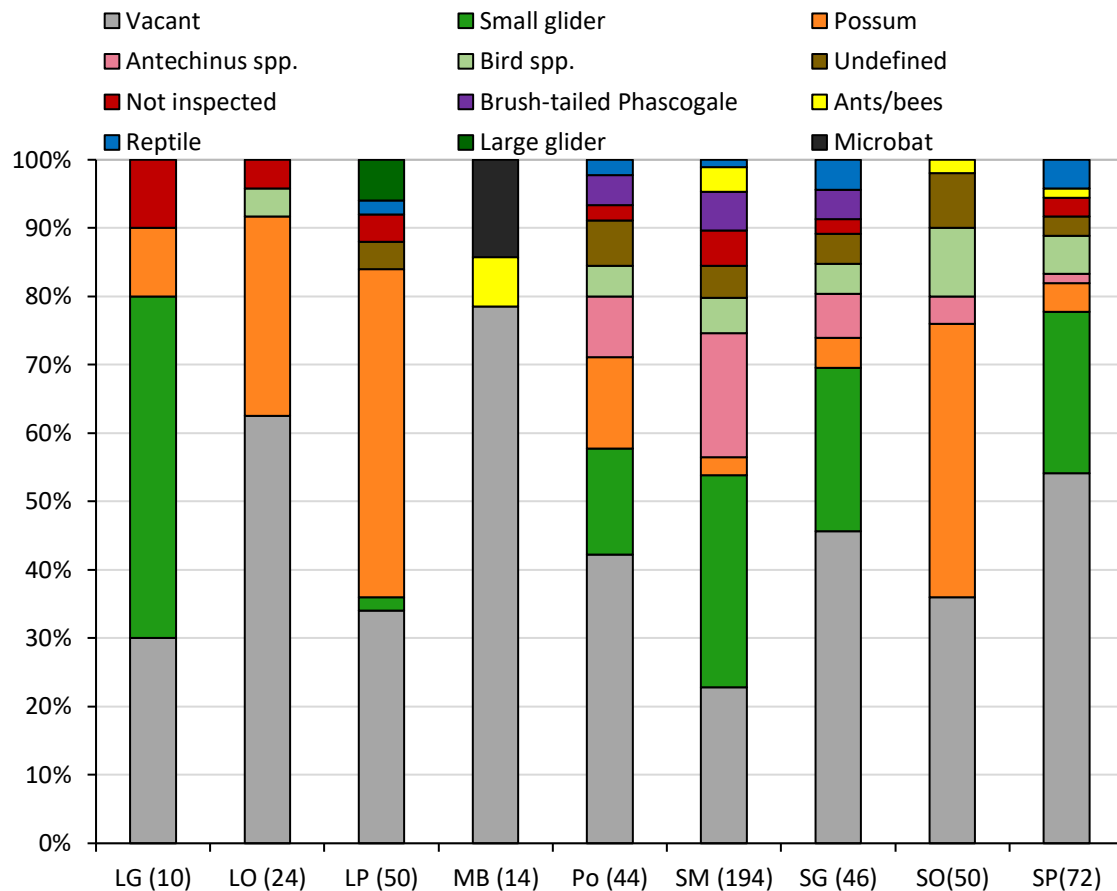


Figure 10: Fauna recorded using design-specific box types during nest box monitoring (2020-2021) at section 2. Numbers in parenthesis indicate the total number of boxes inspected over the two sample periods (spring 2020 and autumn 2021). LG = large glider, LO= large owl, LP= large parrot, MB = microbat, Po=possum, SM = scansorial mammal, SG= small glider, SO= small owl and SP = small parrot. Undefined = remnant nest material or chew markings.

3.1.3 Nest box condition and maintenance

A total of 13 (7.6%) boxes in section 1 and 14 (5.5%) in section 2 required maintenance or replacement during the 2020-21 operational monitoring (Figure 10). The “unknown” nest boxes in Figure 10 include three boxes on inaccessible private property in Section 1, and three boxes unable to be found due to co-ordinate error or burnt in section 2. Causes for repair included burnt (S1 = seven boxes, S2=nine boxes), wire/spring failure (S1 = three boxes, S2 = one box), lid/hinge reattachment (S1=two boxes, S2=four boxes) and wire growing into tree (S1 = one box) (see Appendix A, Table A1 and Appendix B, Table B1). A total of 21 repairs were undertaken in July 2021 including replacement of burnt boxes (n=16) with Cyplas designs, box reinstallation at section 1 (n=2), lid reattachment at section 1 (n=2) and wire repaired on hanging scansorial mammal box at section 1 (n=1) (see Appendix A, Table A1, and Appendix B, Table B1). A further six boxes had deteriorated (i.e. missing one hinge with lid still attached, or partial lid deterioration) yet were deemed functional.

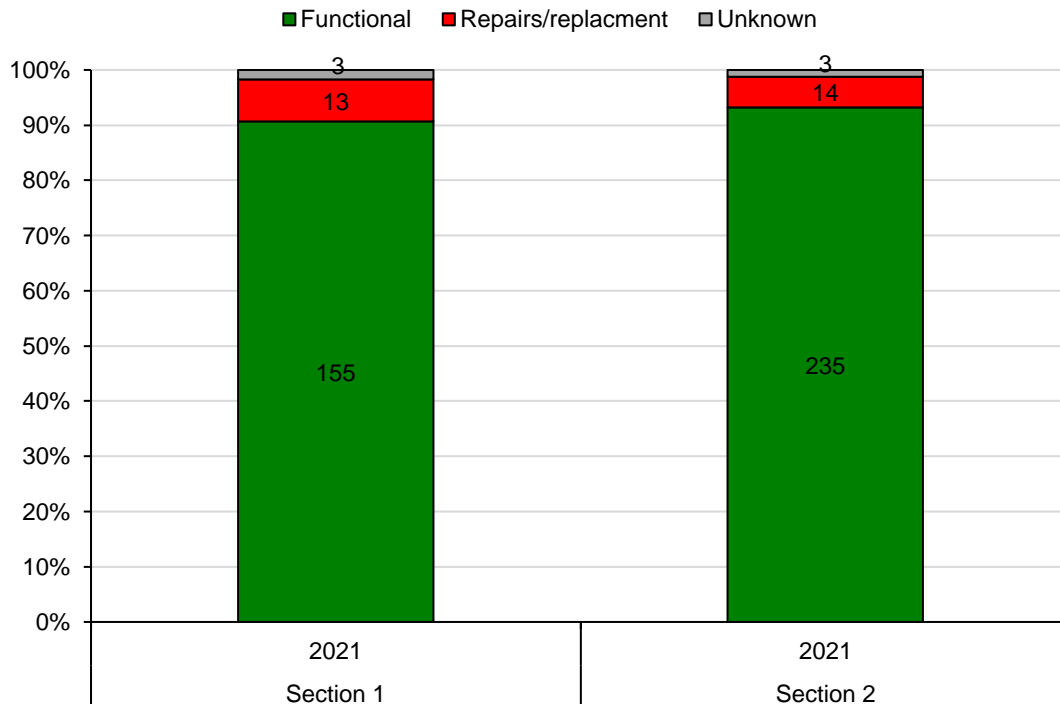


Figure 11: Nest boxes requiring repair or replacement during operational phase monitoring at W2HC (Section 1) and HC2G/WC2G (Section 2), 2020-2021.

3.2 Chainsaw hollows

Excluding hollows not inspected ($n=9$) chainsaw hollow inspections found evidence of use remained constant at 16.2% (7 boxes) during spring 2020 and autumn 2021 monitoring (Figure 11). Feathertail glider nests (*Acrobates spp.*) were found in small mammal ($n=2$ spring/autumn), medium mammal ($n=1$ spring/autumn) and in a small microbat hollow ($n=1$ spring) (see Appendix C, Table C1). *Antechinus spp.* dens were found in medium mammal hollows ($n=2$, one during spring and two during autumn) and a small microbat ($n=1$ autumn) (see appendix C, Table C1). Possible microbat scat was detected in a single box during spring 2020 monitoring (see Appendix C, Table C1).

Two individuals (squirrel glider and *Egernia spp.*) were recorded using chainsaw hollows during the autumn 2021 inspection (Figure 11). Squirrel glider was recorded using a medium mammal hollow (see Appendix C, Table C2), and *Egernia spp.* (Tree-skink) was recorded in a large microbat hollow (see Appendix C, Table C2). Arboreal ant occupancy increased from five hollows in spring 2020 to eight in autumn 2021 (Figure 11).

Vacancy rates decreased from 67.4% (29 hollows) in spring to 55.8% (24 hollows) in autumn (Figure 11). Additionally, nine hollows were not inspected during either sample (Figure 11) due to destruction from bush fires ($n=7$, Plate 2) and two were not found. These are either duplicates in the dataset (i.e. there were two #710 and 714) or were burnt (see Appendix C, Table C1).

During inspections, epicormic growth was removed around several hollows (five during spring 2020 and three during autumn 2021) to facilitate passage for fauna (plate 2, see Appendix D). Arboreal ants were also present in relatively high abundance occupying five hollows during spring and eight during autumn (Figure 12).

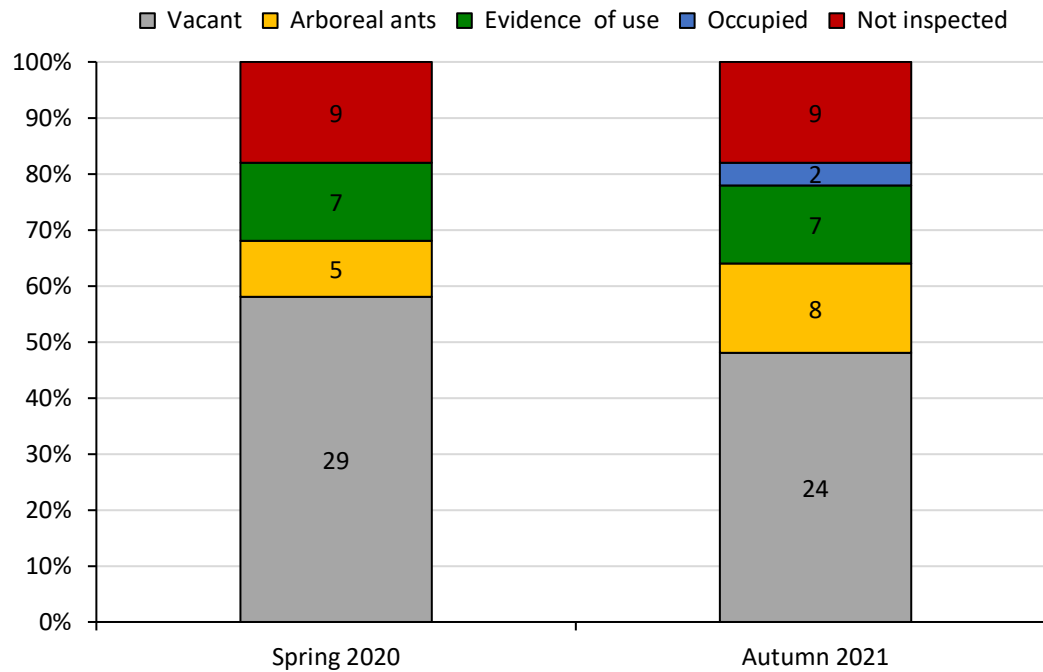


Figure 12: Number and proportion of hollowed used by vertebrate fauna (occupied or evidence of use), arboreal ants, unused (vacant) and boxes not inspected (due to damage or missing) during operational phase monitoring (spring and autumn) at HC2G/WC2G (Section 2), 2020-2021



Plate 2: Epicormic growth surrounding entry of chainsaw hollows (left). One of several chainsaw hollows destroyed by fire (right).

3.2 Bat boxes and structures

Culverts and adjacent bat boxes were inspected on 10 November 2020 and 18 May 2021. Operational phase monitoring of microbat structures found threatened microbat species using (occupying or evidence of use) habitat design features at all impact sites and two of the three control sites (Table 7). Large-footed myotis (in autumn 2020 and spring 2021) were found using two multi-chambered boxes located beneath the Halfway Creek twin bridges (site 25, Table 7). Forty to fifty individuals were located in the box beneath the northbound bridge, and two individuals in the box under the southbound bridge (Table 7). Little bent-winged bats were recorded roosting at three impact sites, Boneys Creek (250-300 individuals), Halfway Creek culvert (450-500 individuals), Glenugie bebo arch (150-175 individuals) and at the Grays road box culvert (control site 80-115) in autumn 2021 (Table 7). Individuals were recorded using culvert joints at all sites with one bat box in the Halfway Creek culvert occupied by little bent-winged bats (see Appendix D, Table D1). No little-bent winged bats were recorded during spring other than one individual roosting in the Halfway Creek culvert (Table 7). Microbats were not observed at North Boneys Creek or Old highway box culverts during both monitoring periods (Table 7). No microbats were recorded using bat boxes installed in adjacent habitat. All boxes were in functional order.

The inspection identified a large area of suitable roosting habitat in addition to bat boxes. Potential roost sites included joins greater than 20 mm wide between box sections, roughened culvert ceiling, uneven box sections and lift points (Plate 2). The Halfway Creek and Boneys Creek culverts had the largest area of roosting habitat with over 40 suitable joins and artificially roughened ceiling recorded at each site (Table 7). The subject culverts could support several thousand non-breeding bent-winged bats during late autumn/winter. The number of bats recorded is not indicative of the total number that are likely to utilise the sites.



Plate 3: Microbat scuff marks around lift point (a) and culvert joints surrounded by roughened concrete (b). Microbat scat below bat boxes (c) and culvert joints (d).

Table 7: Results of microbat drainage structures monitored at sections 1 and 2. * denotes control sites. ^A Includes joins, obverts, roughened concrete, lift points and lip overhangs; SB = southbound; NB = northbound; H'way = Halfway; Sjl= suitable joins; JR = roughened joins

Season	Section	ID	Site Name	Structure type	Roost features	Number of boxes	Species present box	Species present joins/ lift points/lip	No. individuals	Evidence of use box	Evidence of use other habitat ^A	Observed habitat value
Autumn	1	46	Boneys Creek	Box culvert & adj boxes	41 SJ; 31 JR	8	-	<i>Miniopterus australis</i>	250-300	-	Yes	High
	1	49	Nth Boneys	Box culvert	8 SJ; 10 JR	2	-	-	-	-	-	Low- Moderate
	1	66*	Grays Rd	Box culvert	SJ in all cells	0	-	<i>Miniopterus australis</i>	80-115	N/A	Yes	High
	1	67*	Grays Road nth	Pipe culvert		0	NA	-	-	N/A	-	Low
	2	25	H'way Ck culvert	Box culvert	49 SJ; 8 sections with JR	11	NA	<i>Miniopterus australis</i>	450-500 + 4 dead	-	Yes	High
	2	25.1	H'way Ck bridge	Boxes beneath bridge		2	<i>Myotis macropus</i>	-	SB=2; NB45-50	Yes	-	High
	2	32	Glenugie Ck	Bebo arch & boxes (east side only)	12 SJ	4	-	<i>Miniopterus australis</i>	150-175	-	-	High
	2	40*	Old highway	Box culvert	10 SJ	0	NA	-	-	N/A	Yes	High
Spring	1	46	Boneys Creek	Box culvert & adj boxes	41 SJ; 31 JR	8	-	<i>Myotis macropus</i>	2	Yes	Yes	High
	1	49	Nth Boneys	Box culvert	8 SJ; 10 JR	2	-	-	-	Yes	-	Low- Moderate
	1	66*	Grays Rd	Box culvert	SJ in all cells	0	NA	-	-	N/A	Yes	High
	1	67*	Grays Road nth	Box culvert		0	NA	-	-	N/A	-	Low
	2	25	H'way Ck culvert	Box culvert	49 SJ; 8 sections with JR	11	-	<i>Miniopterus australis</i>	1	Yes	Yes	High
	2	25.1	H'way Ck bridge	Boxes beneath bridge		2	<i>Myotis macropus</i>	-	SB=2; NB45-55	Yes	-	High
	2	32	Glenugie Ck	Bebo arch & boxes (east side only)	12 SJ	4	-	-	-	-	-	High
	2	40*	Old highway	Box culvert		0	NA	-	-	N/A	Yes	High

4. Discussion

4.1 Summary of key findings

Tables 8 and 9 present a summary of major findings of the 2020/21 operational nest box and microbat structure monitoring in the context of the performance measures outlined by the relevant management plans for sections 1 and 2 (Biosis, 2014; Ecosure, 2014; Geolink, 2014).

Table 8: Summary of key findings in relation to NBMP's performance criteria for sections 1 and 2 nest boxes.

Performance criteria	Finding
Use of nest boxes by a wide variety of hollow-using native fauna species	Species diversity occupying nest boxes at sections 1 and 2 were higher than other Pacific Highway projects, and is considered to meet the performance criteria of a wide variety of hollow using native species. Furthermore, four threatened species were recorded using nest boxes.
Species using nest boxes is consistent with the nest box design	In section 1, small and medium nest boxes, including small glider, possum, feathertail glider, lorikeet/treecreeper and scansorial mammal designs, were used by the target species. Larger nest boxes, such as cockatoo/owl, quoll and large glider, and microbat boxes were not used by the target species. These findings are consistent with other highway nest box programs.
Low rates of exotic fauna use	Overall, the incidence of feral species occupation was very low. One active European beehive was detected in a single box in section 2 during year one monitoring.
Reduced maintenance requirements	In 2020/21, excluding burnt boxes, maintenance requirements were consistent with and/or lower than other highway projects.

Table 9: Summary of key findings in relation to MMP performance criteria for operational monitoring in sections 1 and 2 microbat drainage structures.

Monitoring component	Performance measure	Finding
Habitat design features within drainage structures	Observe uptake, breeding and persistent use of replacement roosting habitat with evidence of usage confirmed consistently (number not decreasing over two years).	Culvert joins and roughened concrete were readily used by little bent-winged bats. Breeding was not confirmed during this survey yet may occur at Halfway Creek. The monitored structures most likely provide substantially more habitat than was available prior to construction.
Bat boxes	Observe uptake, breeding and persistent use of replacement roosting habitat with evidence of usage confirmed consistently (number not decreasing over two years).	Bat boxes were occupied at Halfway Creek bridge (large-footed myotis) and culvert (little bent-winged) sites, with evidence of use in other impact structures. Myotis may breed in bat boxes at Halfway Creek. Bat boxes in adjacent habitat were not utilised.
Control sites (drainage structures 40, 66, 67).	Identify natural variability of microbats within the project footprint.	Evidence of little bent-winged bats was recorded at reference sites with peak occupancy in late autumn and winter.

4.2 Nest boxes and chainsaw hollows

4.2.1 Use of nest boxes by a wide variety of hollow-using native fauna species

Species richness at W2HC (combined sections 1 W2HC and sections 2/2A HC2G and WC2G) was higher than other nest box projects on the north coast of NSW with a total of 17 species and genera recorded. For example, between nine and 15 species and genera were recorded during monitoring for the Hunter Expressway (Sandpiper 2013), 14 at Nambucca to Urunga (NH2U, Sandpiper 2021) and nine have been recorded on several projects including Warrell Creek to Nambucca Heads (Sandpiper 2020), Cooperook to Herons Creek and Sapphire to Woolgoolga (Sandpiper 2015, 2016).

Small petaurid gliders (sugar and squirrel glider) were frequent nest box users throughout both sections 1 and 2 in spring and autumn 2020/21. This is consistent with Goldingay *et al.* (2020) and is likely a reflection of the species broad habitat requirements, local abundance, and high number of suitable boxes (e.g. boxes with small entrances). Reptiles (2 species) and frogs (1 species) were the least detected fauna group which is not surprising given that they were not targeted by the nest box program and often do not leave obvious evidence of use (i.e. nesting material).

Low use of nest boxes by birds is consistent with other nest box programs (e.g. Menkhurst 1984; Sandpiper 2016, 2017, 2018, 2019). While infrequent use of nest boxes by birds may indicate that adequate hollow resources exist in the local landscape, other limiting factors include: (1) use of nest boxes for temporary roosting (Lindenmayer *et al.* 2009); (2) box thermoregulation (Goldingay and Stevens 2009); (3) placement (nest box location within a tree and landscape) (Saunders *et al.* 2020); (4) competitive interactions with other species and congeners; (5) box humidity (Strain *et al.* 2021); and (6) rapid occupation of suitable boxes by mammals (Lindenmayer *et al.* 2009). These findings suggest that birds make subtle choices about where to build nests and hence nest box placement within a given landscape strongly influences use.

Chainsaw hollows exhibited lower use (46-56% vacancy) in comparison to nest boxes (27%-38% vacancy). Several of the chainsaw hollow designs targeted microbats and only one record of a microbat was obtained. This result is consistent with several other highway projects (Goldingay 2019). Additionally, epicormic growth obstructed flyways and entrances of several microbat chainsaw hollows prior to the spring survey. Epicormic growth may be a continuing maintenance issue. Use of chainsaw hollows by feathertail glider, antechinus and squirrel glider is encouraging and ongoing monitoring may record similar rates of use to nest boxes, as shown by Terry *et al.* (2021) for brush-tailed phascogale and squirrel glider. While use of chainsaw hollows in section 2 was lower than previous studies, uptake of hollows is expected to increase over time.

Monitoring has shown once again that nest boxes are effective in providing habitat for threatened hollow dependent fauna with four threatened species confirmed during the study. These included squirrel glider, yellow-bellied glider, brush-tailed phascogale and Stephens' banded snake, which are all listed as vulnerable under the NSW *Biodiversity Conservation Act 2016*. Squirrel glider was also recorded using a medium sized chainsaw hollow. Use of single boxes by two yellow-bellied gliders is of particular interest as there are only a few records of that species using artificial hollows.

4.2.2 Species use of nest boxes is consistent with the species targeted by the nest box design

Five of nine box types (55%) were used by target species in both sections 1 and 2. Box entrance size is considered important in determining use by target species (Goldingay *et al.* 2020). Small gliders had the highest use by a target species in both sections. This result is consistent with monitoring conducted for the Nambucca Heads to Urunga upgrade where small gliders used 59% of target boxes (Sandpiper 2021). Goldingay *et al.* (2020) found that small gliders were far more likely to use the small glider box due to its small diameter opening in comparison to other nest box designs such as possum, cockatoo and small owl. Lorikeet/treecreeper, scansorial mammal and feathertail glider designs also had small diameter entrances, which likely contribute to moderate levels of use by small gliders.

Acrobates spp. favoured the smaller entry designs with records within the design specific feathertail glider boxes and also scansorial mammal, small glider and lorikeet/treecreeper designs. Possum species (e.g. short-eared brushtail possum, common brushtail possum, and common ringtail possum) were excluded by smaller entrance designs (SG, L/T, SM, MB) with records in design specific possum boxes and also in quoll, Cockatoo/owl and large glider designs.

Lorikeet/treecreeper and parrot boxes recorded relatively low use by target species, a result partly attributed to exclusion through occupation by other species, particularly small gliders (Menkhorst, 1984; Goldingay *et al.* 2020). Glider leaf nests can exclude use by parrots, which prefer a decayed wood base for nesting (Lewis, 2016). Rapid uptake of boxes by gliders would preclude parrots, which only begin searching for nest sites prior to the breeding season.

Cockatoo and large owl designs were not used by the target species, which is consistent with monitoring at other sites (Sandpiper Ecological, 2015, 2017, 2020, Goldingay, 2019). Although glossy-black cockatoo (*C. lathami*) and red-tailed black cockatoo (*C. banksii*) have been recorded using round polyvinyl chloride nest boxes on Kangaroo Island and in western Victoria respectively (Goldingay & Stevens 2009), and Carnaby's black cockatoo (*C. latirostris*) has been recorded using a variety of designs in Western Australia (Groom 2010) there is a paucity of records of cockatoos using plywood nest boxes. It is unclear if this is due to poor design and/or placement, both of which influence box usage by Carnaby's cockatoo (Saunders *et al.* 2020), or an adequate supply of suitable natural hollows. Similarly, there are few records of owls using nest boxes (Thomson 2006; Goldingay 2019). Indeed, owls and cockatoos have not been recorded using any nest boxes installed for the Pacific Highway upgrade and based on existing evidence these box designs should not be included in future nest box programs.

Microbats were not recorded using the target boxes at, which is consistent with several other highway nest box projects (Goldingay 2019). A paucity of knowledge in relation to roosting ecology of microbats and lack of species-specific box designs may contribute to low uptake (Goldingay 2019). A study investigating nest box use by Gould's wattled bat (*Chalinolobus gouldii*) found that occupancy increased 11 fold after a new nest box design was installed. However, Goldingay (2019) highlights that there is no benchmark for tree hollow use by microbats and given their mobile nature, nest boxes are unlikely to provide benefits apart from those associated with installation in drainage structures (bridges and culverts).

4.2.3 Low rates of exotic fauna use

Rates of nest box use by feral species was low during both samples. European bees have been considered a problem for nest box programs as they occupy boxes to the exclusion of targeted species (Beyer and Goldingay, 2006; Lewis, 2016). Occupancy rates for European bees in sections 1

and 2 (only one active hive <1%) was lower or equivalent to nest box monitoring at Coopernook to Herons Creek (2.5% active hives) and Warrell Creek to Nambucca heads (<1% active hives) (Sandpiper 2015, 2020). At NH2U, abandoned European beehives were recorded on 22 occasions, often being replaced by small glider dens during the subsequent sample (Sandpiper, 2021). Observations from previous research (Goldingay *et al.* 2015) suggest European beehive infestations can be ignored as hives are typically abandoned within 12 months and are replaced by native vertebrates. No ameliorative action was undertaken regarding active European beehives during 2020/21 sampling.

Ants were recorded using nest boxes and chainsaw hollows. Ants are commonly found in nest boxes and there is limited information regarding potential competitive interactions between them and native vertebrates (Goldingay 2006). A study by Dobson (2002 cited in Beyer and Goldingay 2006) reported that squirrel gliders were not deterred by the presence of ants and feathertail gliders have been observed in bat boxes containing ants. No ameliorative action was undertaken regarding ant occupancy during the 2020/21 monitoring based on this information.

4.2.4 High level of nest box durability with minimal maintenance requirements.

Aside from nest box damage due to fire (S1 = seven boxes, and S2 = 9 boxes), the majority of nest boxes remain in fair condition. The number of boxes requiring repair or replacement will increase over time, although, considering they have been installed for 5-6 years boxes in sections 1 and 2 have fared better than many other sites. For example, all 79 boxes installed for the Coopernook to Herons Creek upgrade required maintenance or replacement seven years after installation (Sandpiper Ecological 2015), with a similar result recorded at Sapphire to Woolgoolga (Sandpiper, 2016). Beyer and Goldingay (2006) suggested that most plywood boxes would persist for ~5 years but conceded that box design and site features influenced longevity. The increased longevity of boxes in sections 1 and 2 may be due to the predominance of drier forest types and lower rainfall than other monitoring sites.

4.3 Microbat drainage structures

4.3.1 Observe uptake, breeding and persistent use of replacement microbat roosting habitat.

Evidence suggests that the monitored drainage structures provide autumn/winter roosting habitat for a large number of bent-winged bats. Importantly, design features such as wider joints, bat boxes within culverts, and roughened surfaces contribute to the sites roosting potential. Whilst roughened surfaces may not be consistently used as daytime roosts evidence suggests they are used as temporary roosts at night. Breeding was not recorded in structures, although large-footed myotis may breed in bat boxes at Halfway Creek. Evidence suggests that the subject structures provide a larger area of suitable roosting habitat than was available prior to construction.

5. Contingency Measures and Recommendations

5.1 Contingency Measures

Contingency measures specified in the NBMP (Biosis, 2014, Ecosure, 2014) and MMP (Geolink, 2015) with mitigation measures applicable to the project are addressed in bold text in Table 10 (nest boxes) and Table 11 (Microbat drainage structures).

Table 10: Potential problems outlined in NBMP and possible contingency measures.

Problem	Contingency/Corrective action
Poor uptake and usage rates by native fauna	Review the type and number of nest box designs. No action required – nest box occupancy and use by native species is consistent with other projects and published data and is expected to increase over time.
Nest boxes being used by non-target species	Review the selection and number of nest box designs. No action required – 55% of the specific designed box types were used by target species in both sections. Unused box types (i.e. large parrot, owl, quoll) are consistent with other studies. Relocating boxes is unlikely to improve use.
Nest boxes become occupied by exotic or invasive fauna	Review/modify nest box design to exclude undesirable species, treat if applicable or relocate those nest boxes to another location. No action required - incidence of feral species (European bees) occupation was low.
Nest boxes deteriorating rapidly and requiring maintenance	Identify causes of nest box failure, modify design and construct accordingly. Twenty-one boxes were replaced or repaired during the sample period. The proportion of boxes affected by rot, termites and hinge failure is substantially lower than equivalent nest box programs.

Table 11: Problems and contingency measures specified in the section 1 and 2 microbat management plan.

Monitoring component	Problem	Contingency/Corrective action
Habitat design features within drainage structures	Low uptake or non-persistent use (records decreasing over two years)	Modify the design of existing roost features. Consider provision of additional roost features. No action required. Results show high use of monitored structures and artificial habitat features. Significant increase in available habitat compared to pre-construction conditions.
Bat boxes	Low uptake or non-persistent use (records decreasing over two years)	If not inhabited by microbats following completion of construction on the subject drainage structures, bat boxes would be relocated within the new RCBCs. No action required. Most adjacent bat boxes were relocated to drainage structures at Boneys Creek and Boneys Creek north. Relocation at other sites is not deemed necessary due to the high uptake of culvert joins and roughened surfaces, and large amount of suitable permanent habitat.

5.2 Recommendations

Recommendations from the year one operational phase nest box and bat structure monitoring program are summarised in Table 12.

Table 12: Recommendations based on findings from operational phase monitoring and response from TfNSW.

Number	Recommendation	Transport for NSW Response
1.	Continue monitoring as per relevant NBMPs	Agreed and adopted

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Appendix A–Section 1 nest box monitoring data 2020-21.

Table A1: Section 1 (W2HC) autumn and spring nest box monitoring data 2020-2021.

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
1	Cock_Owl	Ply	517887	6674740	26/11/2020	-	Trichosurus spp.	-	Good	-	-
2	Pos	Ply	517876	6674754	28/04/2021	-	Petaurid spp.	-	Good	-	-
3	GLF	Ply	517881	6674744	28/04/2021	-	Acrobates spp.	-	Good	-	-
4	A	Ply	517885	6674761	28/04/2021	-	Not inspected	Not inspected	Severe	Box burnt	Boxes replaced
5	Pos	Ply	517690	6674899	Not inspected	Not inspected	-	-	Good	-	2 x fled
6	GLF	Ply	518093	6676192	22/04/2021	Squirrel glider	Petaurid spp.	-	Good	-	-
7	BTP	Ply	518081	6676202	22/04/2021	-	Antechinus spp.	-	Good	-	-
8	TC	Hardwood	518087	6676214	22/04/2021	-	Petaurid spp.	-	Good	-	-
9	BTP	Ply	518123	6676310	22/04/2021	-	-	-	Good	-	-
9.1	Pos	Cyplas	512446	6686049	27/04/2021	-	-	-	Good	-	-
9.2	FTG	Cyplas	512438	6686045	27/04/2021	-	-	-	Good	-	-
9.3	GLF	Ply	516083	6680753	25/06/2021	-	Acrobates spp.	-	Good	-	-
10	TC	Hardwood	518119	6676322	22/04/2021	-	Old leaf	-	Good	-	-
10.1	Pos	Hardwood	512775	6685858	27/04/2021	-	-	-	Good	-	-
10.1.1	Pos	Cyplas	512827	6685956	27/04/2021	-	Antechinus spp.	-	Good	-	-
10.1.2	BTP	Ply	512793	6685982	27/04/2021	-	-	Not inspected	Severe	Destroyed	Boxes replaced
10.2	Cock_Owl	Ply	512786	6685860	Not inspected	-	-	-	Good	-	-
10.3	B1	Ply	512760	6685876	27/04/2021	-	Petaurid spp.	-	Good	-	-
10.4	SmP	Ply	512807	6685856	27/04/2021	-	Old leaf	-	Good	-	-
10.5	GLF	Ply	512852	6685768	27/04/2021	-	Brush-tailed Phascogale	-	Good	-	-
10.6	Pos	Cyplas	512857	6685759	27/04/2021	-	Trichosurus spp.	-	Good	-	Climber
10.7	Cock_Owl	Ply	512857	6685783	25/06/2021	-	Antechinus spp.	-	Good	-	-
10.8	Pos	Hardwood	512857	6685783	28/04/2021	-	-	Not inspected	Severe	destroyed	Boxes replaced
10.9	GLF	Ply	512834	6685946	Not inspected	-	Acrobates spp.	-	Good	-	-
11	FTG	Ply	518119	6676322	25/11/2020	-	Petaurid spp.	-	Good	-	Climber
12	Cock_Owl	Ply	517941	6676221	25/06/2021	-	Antechinus spp.	-	Good	-	-
13	A	Ply	517936	6676229	27/04/2021	-	-	-	Good	-	-
14	GLF	Ply	517919	6676212	27/04/2021	Sugar glider	Antechinus spp.	-	Good	-	-
14.1	SmP	Ply	513202	6684061	28/04/2021	-	-	-	Good	-	-
14.2	B1	Ply	513203	6684070	28/04/2021	-	-	Not inspected	Severe	Tree cut down box fine needs putting back up	Box put back up tree
14.3	FTG	Ply	513207	6684055	Not inspected	-	-	Active ants nest	Good	-	-
14.4	GLF	Ply	513327	6684024	28/04/2021	Aboreal Ants	-	Active ants nest	Good	-	-
14.5	BTP	Ply	513331	6684022	28/04/2021	Aboreal Ants	Antechinus spp.	-	Good	-	-
14.6	Pos	Cyplas	513344	6684015	28/04/2021	-	Trichosurus spp.	-	Good	-	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
15	Pos	Ply	517921	6676234	27/04/2021	-	Petaurid spp.	-	Good	-	-
15.1	GLF	Ply	513478	6683473	28/04/2021	-	-	-	Good	-	-
15.2	B1	Ply	513463	6683494	28/04/2021	-	Acrobates spp.	-	Good	-	-
15.3	FTG	Ply	513457	6683489	28/04/2021	-	Petaurid spp.	-	Good	-	-
16	GLF	Ply	517980	6676348	27/04/2021	-	-	-	Good	-	-
17	B1	Ply	517824	6675620	26/11/2020	-	-	Not inspected	Severe	Box down	Boxes replaced
18	GLF	Ply	517808	6675621	Not inspected	-	Antechinus spp.	-	Good	-	-
19	A	Ply	517803	6675610	26/11/2020	-	Acrobates spp.	-	Good	-	-
20	FTG	Ply	517794	6675595	26/11/2020	-	-	-	Climber box	-	Climber
21	PO	Metal	517765	6675548	25/06/2021	-	-	-	Good	-	-
22	Pos	Ply	517765	6675548	26/11/2020	-	-	-	Good	-	-
23	A	Metal	517782	6675569	26/11/2020	-	-	Active ants nest	Good	-	Moved to 515397.6681176
23.1	GLF	Ply	515397	6681176	13/11/2020	Aboreal Ants	Petaurid spp.	-	Good	-	-
23.2	BTP	Ply	515414	6681180	13/11/2020	-	-	-	Good	-	-
24	STQ	Ply	517776	6675305	25/11/2020	-	Petaurid spp.	-	Good	-	-
25	SmP	Hardwood	517779	6675275	26/11/2020	-	Trichosurus spp.	-	Good	-	-
26	STQ	Ply	517923	6676177	27/04/2021	-	Antechinus spp.	-	Good	Mod deterioration	-
26.1	A	Ply	517061	6679557	26/11/2020	-	-	-	Good	-	-
26.2	B1	Cyplas	517056	6679552	26/11/2020	-	-	Active ants	Good	-	-
26.3	GLF	Ply	517060	6679581	26/11/2020	Aboreal Ants	Petaurid spp.	-	Good	Mod deterioration	-
26.4	SmP	Ply	517023	6679624	26/11/2020	-	Treecreeper spp.	-	Good	-	-
27	GLF	Ply	517821	6676108	26/11/2020	-	-	-	Good	-	-
28	A	Ply	518240	6677259	29/04/2021	Antechinus spp.	Acrobates spp.	-	Good	Need new wire, half hanging off tree	Wire repaired
29		Ply	518251	6677280	28/04/2021	-	Antechinus spp.	-	Good	-	-
30	TC	Hardwood	518243	6677263	29/04/2021	-	Not inspected	Not inspected	Good	-	Boxes replaced
30.1	BTP	Ply	517772	6677807		Not inspected	Acrobates spp.	-	Good	-	-
30.2	SmP	Ply	517782	6677830	26/11/2020	-	Acrobates spp.	-	Good	Need to put lid back on	Lid reattached
31	A	Ply	517871	6677774	29/04/2021	-	Antechinus spp.	-	Good	-	-
31.1	GLF	Ply	518139	6677028	29/04/2021	-	Antechinus spp.	-	Good	-	-
31.2	FTG	Ply	518116	6677030	29/04/2021	-	-	-	Good	-	-
31.3	SmP	Ply	517979	6677044	29/04/2021	-	-	-	Good	-	-
31.4	B1	Ply	518023	6677025	29/04/2021	-	Antechinus spp.	-	Lid deterioration	-	-
31.5	GLF	Ply	518018	6677036	26/11/2020	-	Acrobates spp.	-	Good	-	-
32	A	Metal	517861	6677766	29/04/2021	-	-	-	Poor	-	Grown into tree
33	BTP	Metal	517854	6677773		-	Acrobates spp.	-	Good	-	-
34	BTP	Ply	515547	6681787	28/04/2021	-	Petaurid spp.	-	Good	-	-
34.1	GLF	Ply	517827	6675795	29/04/2021	-	-	Mud Wasps nest	Good	-	-
35		Ply	515542	6681801	28/04/2021	-	Not inspected	-	Good	Box down	Box put back up tree

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
35.1	GLF	Ply	517727	6675166		-	Petaurid spp.	-	Good	-	-
36	Pos	Ply	515578	6681571	29/04/2021	-	-	-	Good	-	-
37	FTG	Metal	515578	6681571	29/04/2021	-	Petaurid spp.	-	Good	-	-
39	FTG	Ply	515653	6681494	29/04/2021	-	-	Active ants nest	Good	-	-
40	TC	Metal	515661	6681487	29/04/2021	Aboreal Ants	-	-	Good	-	Climber
41	BOO	Ply	515563	6681824	25/06/2021	-	Antechinus spp.	-	Good	-	-
42	Pos	Ply	515556	6681839	28/04/2021	-	Petaurid spp.	-	Good	-	-
43	SmP	Metal	515715	6681382	29/04/2021	-	Petaurid spp.	-	Good	-	-
44	BTP	Ply	515714	6681373	29/04/2021	-	-	-	Good	-	-
45	A	Metal	515703	6681390	29/04/2021	-	-	-	Good	-	-
46	Pos	Ply	515739	6681313	29/04/2021	-	-	-	Good	-	-
47	FTG	Ply	515768	6681332	29/04/2021	Petaurid spp.	Old leaf	-	Good	-	-
48	TC	Hardwood	515897	6681243	29/04/2021	-	Old leaf	-	Good	-	-
49	GLF	Metal	515885	6681239	29/04/2021	-	-	-	Good	-	-
50	STQ	Metal	516020	6681055	28/04/2021	-	Trichosurus spp.	-	Good	-	Climber
51	Cock_Owl	Ply	516004	6681090	25/06/2021	-	-	-	Good	-	Couldn't see head
52	Pos	Metal	516016	6681081	28/04/2021	-	Petaurid spp.	-	Good	-	-
53	Pos	Metal	515654	6681131	28/04/2021	-	-	-	Good	-	-
54	BTP	Metal	515694	6681126	28/04/2021	-	Petaurid spp.	-	Good	-	-
55	SmP	Metal	513856	6682742	28/04/2021	-	-	Active ants nest	Good	-	-
56	BTP	Metal	513858	6682746	28/04/2021	Aboreal Ants	Trichosurus spp.	-	Good	-	-
57	Pos	Ply	513847	6682753	28/04/2021	-	Petaurid spp.	-	Good	-	-
58	BTP	Ply	513905	6682673	28/04/2021	-	-	-	Good	-	-
59	B1	Ply	513912	6682674	28/04/2021	-	-	-	Good	-	-
60	FTG	Ply	514001	6682604	28/04/2021	Sugar glider	Petaurid spp.	-	Good	-	-
61	GLF	Metal	514008	6682611	28/04/2021	-	-	-	Good	-	-
62	FTG	Metal	514207	6682629	28/04/2021	Petaurid spp.	Trichosurus spp.	-	Good	-	-
63	STQ	Ply	514092	6682618	28/04/2021	-	Acrobates spp.	-	Good	-	-
64	GLF	Ply	514081	6682626	28/04/2021	-	Petaurid spp.	-	Good	-	-
65	TC	Hardwood	514091	6682603	28/04/2021	-	Lorikeet spp.	-	Good	-	-
66	GLF	Ply	517158	6679308	29/04/2021	-	-	-	Good	-	-
67	FTG	Ply	517161	6679270	29/04/2021	Sugar glider	-	-	Good	-	-
68	BTP	Ply	517604	6678550	29/04/2021	Squirrel glider	Antechinus spp.	-	Good	-	-
69	FTG	Ply	517587	6678544	29/04/2021	-	Antechinus spp.	-	Good	-	-
70		Ply	517608	6678541	29/04/2021	-	Not inspected	Not inspected	Severe	-	Box down
71	STQ	Metal	517580	6678554	Not inspected	Not inspected	Antechinus spp.	-	Good	-	-
72	A	Ply	514209	6682626	28/04/2021	-	Antechinus spp.	-	Good	-	-
73	TC	Hardwood	514203	6682630	28/04/2021	-	-	Ant material	Good	-	-
74	A	Metal	514089	6682628	28/04/2021	-	-	Not inspected	No access	No access	No access
75	B1	Ply	514452	6682565	Not inspected	-	-	Not inspected	No access	No access	No access

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
76	TC	Hardwood	514445	6682563	Not inspected	-	-	Not inspected	No access	No access	No access
77	BTP	Metal	514467	6682552	Not inspected	-	Antechinus spp.	-	Good	-	-
78		Metal	509931	6687485	22/04/2021	-	Petaurid spp.	-	Good	-	-
79	GLF	Ply	509946	6687483	22/04/2021	-	Old leaf	Paper wasp nest over entrance	Good	-	-
80	TC	Hardwood	509963	6687490	22/04/2021	-	Trichosurus spp.	-	Good	-	-
81	STQ	Ply	510124	6687688	27/04/2021	-	Acrobates spp.	-	Good	-	-
82		Ply	518268	6676963	22/04/2021	-	Acrobates spp.	-	Good	-	-
82		Ply	510125	6687647	27/04/2021	-	-	-	Good	-	-
83	B1	Ply	510929	6686893	27/04/2021	-	-	-	Good	Hinges need new lid	Climber
84	Cock_Owl	Ply	510865	6686934	25/06/2021	Common brushtail possum	Petaurid spp.	-	Good	-	-
85	Pos	Metal	510869	6686928	27/04/2021	-	Australian owl nightjar	-	Good	-	Climber
86	Cock_Owl	Metal	513124	6685001	25/06/2021	-	Petaurid spp.	-	Good	-	-
87	Pos	Ply	513114	6684978	28/04/2021	-	Australian owl nightjar	-	Good	-	Climber
88	Cock_Owl	Ply	513114	6684384	25/06/2021	-	Trichosurus spp.	-	Good	-	-
89	Pos	Metal	513114	6684384	28/04/2021	-	-	-	Good	-	-
90	Pos	Metal	513118	6684369	28/04/2021	-	-	-	Good	-	-
91	BTP	Ply	513115	6684358	28/04/2021	-	Petaurid spp.	-	Good	-	Fled nest
92	TC	Hardwood	513134	6684516	28/04/2021	-	-	-	Good	-	-
93	GLF	Metal	513122	6684524	28/04/2021	-	-	-	Good	-	-
94	BTP	Metal	513131	6684564	28/04/2021	-	-	-	Good	-	-
95	BOO	Metal	512990	6685583	27/04/2021	-	Petaurid spp.	-	Good	-	-
96	Pos	Ply	512989	6685591	27/04/2021	-	-	-	Good	-	-
97	B1	Ply	512090	6686250	28/04/2021	-	Old leaf	-	Good	-	-
98	SmP	Hardwood	513792	6683002	28/04/2021	-	-	-	Good	-	-
99	B1	Ply	513799	6682968	28/04/2021	-	Petaurid spp.	-	Good	-	-
100	BTP	Ply	513782	6682979	28/04/2021	-	Old leaf	-	Good	-	-
101	FTG	Metal	513771	6683004	28/04/2021	-	Antechinus spp.	-	Good	-	-
102	A	Ply	513801	6682922	28/04/2021	-	Petaurid spp.	-	Good	-	-
103	BTP	Metal	513812	6682917	28/04/2021	-	Petaurid spp.	-	Good	-	-
105	GLF	Metal	513541	6683568	28/04/2021	-	-	Not inspected	Severe	Burnt	Boxes replaced
106	A	Ply	513537	6683578	Not inspected	-	-	-	Good	-	-
107	TC	Metal	513519	6683596	28/04/2021	-	-	Not inspected	Severe	Burnt	Boxes replaced
108	GLF	Ply	513483	6683667	Not inspected	-	-	Active paper wasp nest	Good	-	-
109	BTP	Metal	513486	6683659	28/04/2021	-	Petaurid spp.	-	Good	-	-
110	TC	Hardwood	513570	6683735	28/04/2021	-	Petaurid spp.	-	Good	-	-
111	BOO	Ply	513468	6683789	28/04/2021	-	-	-	Good	-	-
112	Pos	Metal	513468	6683789	28/04/2021	-	-	-	Good	-	-
113	Pos	Ply	513163	6683899	28/04/2021	Antechinus	Antechinus spp.	-	Good	-	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
						spp.					
114	TC	Hardwood	510853	6686948	27/04/2021	-	-	-	Good	-	-
115	STQ	Metal	516236	6680819	28/04/2021	-	-	-	Good	-	Climber
116	Pos	Ply	516194	6680814	25/06/2021	Common brushtail possum	Antechinus spp.	-	Good	-	-
117	A	Ply	516225	6680820	28/04/2021	-	Petaurid spp.	-	Good	-	Fleed box
118	GLF	Ply	516229	6680826	28/04/2021	-	-	-	Good	-	-
119	B1	Ply	516240	6680885	28/04/2021	-	-	-	Good	-	-
120	SmP	Hardwood	516266	6680758	28/04/2021	Squirrel glider	-	-	Good	-	-
121	BTP	Metal	516324	6680564	28/04/2021	Sugar glider	Trichosurus spp.	-	Good	-	Climber
122	Cock_Owl	Ply	516241	6680854	25/06/2021	-	-	-	Good	-	-
123	Pos	Metal	516241	6680854		-	Petaurid spp.	-	Good	-	-
124	GLF	Metal	516083	6680903	28/04/2021	-	Antechinus spp.	-	Good	-	-
125	TC	Hardwood	516070	6680914	28/04/2021	-	-	-	Good	-	-
126	GLF	Metal	516560	6680278	29/04/2021	Squirrel glider	Petaurid spp.	Wasps nest	Good	-	-
127	Cock_Owl	Metal	516588	6680243	29/04/2021	-	-	-	Good	-	-
128	Pos	Metal	516588	6680243		-	Petaurid spp.	-	Good	-	-
129	BTP	Ply	516693	6680109	29/04/2021	-	Old leaf	-	Good	-	-
130	SmP	Metal	516708	6680092	29/04/2021	-	-	-	Good	-	-
131	GLF	Ply	516709	6679838	28/04/2021	Sugar glider	Petaurid spp.	-	Good	-	-
132	BTP	Ply	516515	6680068	28/04/2021	-	Petaurid spp.	-	Good	-	-
133	TC	Hardwood	516531	6680059	28/04/2021	-	Antechinus spp.	-	Good	-	-
134	TC	Hardwood	518260	6676929	22/04/2021	-	-	-	Good	-	Climber
2	Pos	Ply	517876	6674754	26/11/2020	-	Trichosurus spp.	-	Good	-	-
3	GLF	Ply	517881	6674744	26/11/2020	-	Petaurid spp.	-	Good	-	-
4	A	Ply	517885	6674761	26/11/2020	-	Antechinus spp.	-	Good	-	-
5	Pos	Ply	517690	6674899	26/11/2020	Not inspected	Not inspected	Not inspected	Good	Box need replacing	Box burnt
6	GLF	Ply	518093	6676192	25/11/2020	Petaurid spp.	-	-	Good	-	-
7	BTP	Ply	518081	6676202	25/11/2020	-	Petaurid spp.	-	Good	-	-
8	TC	Hardwood	518087	6676214	25/11/2020	Squirrel glider	-	-	Good	-	-
9	BTP	Ply	518123	6676310	25/11/2020	-	Petaurid spp.	-	Good	-	-
9.1	Pos	Cyplas	512446	6686049	13/11/2020	-	Trichosurus spp.	-	Good	-	-
9.2	FTG	Cyplas	512438	6686045	13/11/2020	-	-	-	Good	-	-
9.3	GLF	Ply	516083	6680753	25/11/2020	-	Old leaf	-	Good	-	
10	TC	Hardwood	518119	6676322	25/11/2020	-	Acrobates spp.	-	Good	-	-
10.1	Pos	Hardwood	512775	6685858	13/11/2020	-	-	Old ant material	Good	-	-
10.1 1	Pos	Cyplas	512827	6685956	13/11/2020	-	-	-	Good	-	-
10.1 2	BTP	Ply	512793	6685982	13/11/2020	-	Antechinus spp.	-	Good	-	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
10.2	Cock_Owl	Ply	512786	6685860	13/11/2020	Not inspected	Not inspected	Not inspected	Good	-	Completely destroyed
10.3	B1	Ply	512760	6685876	13/11/2020	-	-	-	Good	-	-
10.4	SmP	Ply	512807	6685856	13/11/2020	-	Petaurid spp.	-	Good	-	-
10.5	GLF	Ply	512852	6685768	13/11/2020	-	Petaurid spp.	-	Good	-	-
10.6	Pos	Cyplas	512857	6685759	13/11/2020	-	Petaurid spp.	-	Good	-	-
10.7	Cock_Owl	Ply	512857	6685783	13/11/2020	-	Trichosurus spp.	-	Good	-	Climber
10.8	Pos	Hardwood	512857	6685783	13/11/2020	-	Antechinus spp.	-	Good	-	-
10.9	GLF	Ply	512834	6685946	13/11/2020	Not inspected	Not inspected	Not inspected	Good	-	Completely destroyed
11	FTG	Ply	518119	6676322	25/11/2020	-	Acrobates spp.	-	Good	-	-
12	Cock_Owl	Ply	517941	6676221	26/11/2020	-	Petaurid spp.	-	Good	-	Climber
13	A	Ply	517936	6676229	26/11/2020	-	Acrobates spp.	-	Good	-	-
14	GLF	Ply	517919	6676212	26/11/2020	-	Petaurid spp.	-	Good	-	-
14.1	SmP	Ply	513202	6684061	25/11/2020	-	Antechinus spp.	-	Good	-	-
14.2	B1	Ply	513203	6684070	25/11/2020	-	-	-	Good	-	-
14.3	FTG	Ply	513207	6684055	25/11/2020	-	Petaurid spp.	-	Good	-	-
14.4	GLF	Ply	513327	6684024	13/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
14.5	BTP	Ply	513331	6684022	13/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
14.6	Pos	Cyplas	513344	6684015	13/11/2020	-	Trichosurus spp.	-	Good	-	Scat inside casuarina used
15	Pos	Ply	517921	6676234	26/11/2020	-	Trichosurus spp.	-	Good	-	-
15.1	GLF	Ply	513478	6683473	13/11/2020	-	Petaurid spp.	-	Good	-	-
15.2	B1	Ply	513463	6683494	13/11/2020	-	-	-	Good	-	-
15.3	FTG	Ply	513457	6683489	13/11/2020	-	Acrobates spp.	-	Good	-	-
16	GLF	Ply	517980	6676348	26/11/2020	-	Petaurid spp.	-	Good	-	-
17	B1	Ply	517824	6675620	26/11/2020	-	-	-	Good	-	-
18	GLF	Ply	517808	6675621	26/11/2020	Not inspected	Not inspected	Not inspected	Good	Box need replacing	Box down
19	A	Ply	517803	6675610	26/11/2020	-	Acrobates spp.	-	Good	-	-
20	FTG	Ply	517794	6675595	26/11/2020	-	Acrobates spp.	-	Good	-	-
21	PO	Metal	517765	6675548	26/11/2020	-	-	-	Good	-	Climber box
22	Pos	Ply	517765	6675548	26/11/2020	-	-	-	Good	-	-
23	A	Metal	517782	6675569	26/11/2020	-	-	-	Good	-	-
23.1	GLF	Ply	515397	6681176	13/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
23.2	BTP	Ply	515414	6681180	13/11/2020	Petaurid spp.	-	-	Good	-	-
24	STQ	Ply	517776	6675305	26/11/2020	Not inspected	Not inspected	Not inspected	Good	-	Box missing
25	SmP	Hardwood	517779	6675275	26/11/2020	-	Petaurid spp.	-	Good	-	-
26	STQ	Ply	517923	6676177	26/11/2020	-	Trichosurus spp.	-	Good	-	-
26.1	A	Ply	517061	6679557	26/11/2020	-	Antechinus spp.	-	Good	Mod deterioration	-
26.2	B1	Cyplas	517056	6679552	26/11/2020	-	-	-	Good	-	-
26.3	GLF	Ply	517060	6679581	26/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
26.4	SmP	Ply	517023	6679624	26/11/2020	-	Petaurid spp.	-	Good	Mod deterioration	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
27	GLF	Ply	517821	6676108	26/11/2020	-	Treecreeper spp.	-	Good	-	-
28	A	Ply	518240	6677259	26/11/2020	-	Antechinus spp.	-	Good	-	-
29		Ply	518251	6677280	26/11/2020	-	Acrobates spp.	-	Good	New wire	-
30	TC	Hardwood	518243	6677263	26/11/2020	-	Antechinus spp.	-	Good	-	-
30.1	BTP	Ply	517772	6677807	26/11/2020	Not inspected	Not inspected	Not inspected	Good	Need new box	Box destroyed, termites
30.2	SmP	Ply	517782	6677830	26/11/2020	-	Acrobates spp.	-	Good	-	-
31	A	Ply	517871	6677774	26/11/2020	-	Acrobates spp.	-	Good	Replace box	-
31.1	GLF	Ply	518139	6677028	26/11/2020	-	Antechinus spp.	-	Good	-	-
31.2	FTG	Ply	518116	6677030	26/11/2020	-	Antechinus spp.	-	Good	-	-
31.3	SmP	Ply	517979	6677044	26/11/2020	-	-	-	Good	-	Climber
31.4	B1	Ply	518023	6677025	26/11/2020	-	-	-	Good	-	-
31.5	GLF	Ply	518018	6677036	26/11/2020	-	Petaurid spp.	-	Lid deterioration	-	-
32	A	Metal	517861	6677766	26/11/2020	-	Acrobates spp.	-	Good	-	-
33	BTP	Metal	517854	6677773	26/11/2020	-	Antechinus spp.	-	Good	-	-
34	BTP	Ply	515547	6681787	27/11/2020	-	Acrobates spp.	-	Good	-	-
34.1	GLF	Ply	517827	6675795	26/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
35		Ply	515542	6681801	27/11/2020	-	-	Mud Wasps nest	Good	-	-
35.1	GLF	Ply	517727	6675166	Not inspected	Not inspected	Not inspected	Not inspected	Not inspected	-	Box down
36	Pos	Ply	515578	6681571	27/11/2020	-	Petaurid spp.	-	Good	-	-
37	FTG	Metal	515578	6681571	27/11/2020	-	-	-	Good	-	-
39	FTG	Ply	515653	6681494	27/11/2020	-	Petaurid spp.	-	Good	-	-
40	TC	Metal	515661	6681487	27/11/2020	-	-	-	Good	-	-
41	BOO	Ply	515563	6681824	27/11/2020	Common brushtail possum	-	-	Good	-	Climber
42	Pos	Ply	515556	6681839	27/11/2020	-	Trichosurus spp.	-	Good	-	-
43	SmP	Metal	515715	6681382	27/11/2020	-	Petaurid spp.	-	Good	-	-
44	BTP	Ply	515714	6681373	27/11/2020	-	Petaurid spp.	-	Good	-	-
45	A	Metal	515703	6681390	27/11/2020	-	-	-	Good	-	-
46	Pos	Ply	515739	6681313	27/11/2020	-	-	-	Good	-	-
47	FTG	Ply	515768	6681332	27/11/2020	-	Petaurid spp.	-	Good	-	-
48	TC	Hardwood	515897	6681243	27/11/2020	-	Old leaf	-	Good	-	-
49	GLF	Metal	515885	6681239	27/11/2020	-	Petaurid spp.	-	Good	-	-
50	STQ	Metal	516020	6681055	25/11/2020	-	-	-	Good	-	-
51	Cock_Owl	Ply	516004	6681090	25/11/2020	-	-	-	Good	-	Climber
52	Pos	Metal	516016	6681081	25/11/2020	Trichosurus spp.	-	-	Good	-	Couldn't see head
53	Pos	Metal	515654	6681131	13/11/2020	-	Petaurid spp.	-	Good	-	-
54	BTP	Metal	515694	6681126	13/11/2020	-	-	-	Good	-	-
55	SmP	Metal	513856	6682742	27/11/2020	-	Petaurid spp.	-	Good	-	-
56	BTP	Metal	513858	6682746	27/11/2020	-	-	-	Good	-	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
57	Pos	Ply	513847	6682753	27/11/2020	-	Trichosurus spp.	-	Good	-	-
58	BTP	Ply	513905	6682673	27/11/2020	-	Petaurid spp.	-	Good	-	-
59	B1	Ply	513912	6682674	27/11/2020	-	-	-	Good	-	-
60	FTG	Ply	514001	6682604	27/11/2020	-	Petaurid spp.	-	Good	-	-
61	GLF	Metal	514008	6682611	27/11/2020	-	Petaurid spp.	-	Good	-	-
62	FTG	Metal	514207	6682629	27/11/2020	-	Acrobates spp.	-	Good	-	-
63	STQ	Ply	514092	6682618	27/11/2020	-	Trichosurus spp.	-	Good	-	-
64	GLF	Ply	514081	6682626	27/11/2020	-	Petaurid spp.	-	Good	-	-
65	TC	Hardwood	514091	6682603	27/11/2020	-	Petaurid spp.	-	Good	-	-
66	GLF	Ply	517158	6679308	26/11/2020	Scaly-breasted lorikeet	-	-	Good	-	-
67	FTG	Ply	517161	6679270	26/11/2020	-	Petaurid spp.	-	Good	-	-
68	BTP	Ply	517604	6678550	27/11/2020	Squirrel glider	-	-	Good	-	-
69	FTG	Ply	517587	6678544	27/11/2020	-	Antechinus spp.	-	Good	-	-
70		Ply	517608	6678541	27/11/2020	-	Acrobates spp.	-	Good	-	-
71	STQ	Metal	517580	6678554	27/11/2020	-	-	-	Good	-	-
72	A	Ply	514209	6682626	27/11/2020	-	Antechinus spp.	-	Good	-	-
73	TC	Hardwood	514203	6682630	27/11/2020	-	Antechinus spp.	-	Good	-	-
74	A	Metal	514089	6682628	27/11/2020	-	-	-	Good	-	-
75	B1	Ply	514452	6682565	Not inspected	Not inspected	Not inspected	Not inspected	No access	No access	No access
76	TC	Hardwood	514445	6682563	Not inspected	Not inspected	Not inspected	Not inspected	No access	No access	No access
77	BTP	Metal	514467	6682552	Not inspected	Not inspected	Not inspected	Not inspected	No access	No access	No access
78		Metal	509931	6687485	11/11/2020	-	Antechinus spp.	-	Good	-	-
79	GLF	Ply	509946	6687483	11/11/2020	Squirrel glider	-	-	Good	-	-
80	TC	Hardwood	509963	6687490	11/11/2020	-	Old leaf	-	Good	-	-
81	STQ	Ply	510124	6687688	13/11/2020	-	-	-	Good	-	-
82		Ply	518268	6676963	13/11/2020	-	Acrobates spp.	-	Good	-	-
82		Ply	510125	6687647	26/11/2020	-	Acrobates spp.	-	Good	-	-
83	B1	Ply	510929	6686893	25/11/2020	-	-	-	Good	-	-
84	Cock_Owl	Ply	510865	6686934	25/11/2020	-	Trichosurus spp.	-	Good	-	-
85	Pos	Metal	510869	6686928	25/11/2020	-	-	-	Good	-	-
86	Cock_Owl	Metal	513124	6685001	25/11/2020	-	Petaurid spp.	-	Good	-	-
87	Pos	Ply	513114	6684978	25/11/2020	-	Petaurid spp.	-	Good	-	-
88	Cock_Owl	Ply	513114	6684384	25/11/2020	-	Petaurid spp.	-	Good	-	-
89	Pos	Metal	513114	6684384	25/11/2020	-	Trichosurus spp.	-	Good	-	-
90	Pos	Metal	513118	6684369	25/11/2020	-	-	-	Good	-	-
91	BTP	Ply	513115	6684358	25/11/2020	-	-	-	Good	-	-
92	TC	Hardwood	513134	6684516	25/11/2020	Australian owl nightjar	-	-	Good	-	Fled nest
93	GLF	Metal	513122	6684524	25/11/2020	-	-	-	Good	-	-

Box ID	Box	Material	Eastings	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
94	BTP	Metal	513131	6684564	25/11/2020	-	-	-	Good	-	-
95	BOO	Metal	512990	6685583	13/11/2020	-	-	-	Good	-	-
96	Pos	Ply	512989	6685591	13/11/2020	-	-	-	Good	-	-
97	B1	Ply	512090	6686250	25/11/2020	-	-	-	Good	-	-
98	SmP	Hardwood	513792	6683002	27/11/2020	-	Petaurid spp.	-	Good	-	-
99	B1	Ply	513799	6682968	27/11/2020	-	-	-	Good	-	-
100	BTP	Ply	513782	6682979	27/11/2020	-	Petaurid spp.	-	Good	-	-
101	FTG	Metal	513771	6683004	27/11/2020	-	Old leaf	-	Good	-	-
102	A	Ply	513801	6682922	27/11/2020	-	Antechinus spp.	-	Good	-	-
103	BTP	Metal	513812	6682917	27/11/2020	-	Petaurid spp.	-	Good	-	-
105	GLF	Metal	513541	6683568	13/11/2020	-	Petaurid spp.	-	Good	-	-
106	A	Ply	513537	6683578	Not inspected	Not inspected	Not inspected	Not inspected	Not inspected	-	burnt
107	TC	Metal	513519	6683596	13/11/2020	-	-	-	Good	-	-
108	GLF	Ply	513483	6683667	Not inspected	Not inspected	Not inspected	Not inspected	Not inspected	-	burnt
109	BTP	Metal	513486	6683659	13/11/2020	-	-	Active paper wasp nest	Good	-	-
110	TC	Hardwood	513570	6683735	13/11/2020	-	Petaurid spp.	-	Good	-	-
111	BOO	Ply	513468	6683789	13/11/2020	-	Petaurid spp.	-	Good	-	-
112	Pos	Metal	513468	6683789	13/11/2020	-	-	-	Good	-	-
113	Pos	Ply	513163	6683899	25/11/2020	-	Petaurid spp.	-	Good	-	-
114	TC	Hardwood	510853	6686948	25/11/2020	-	-	-	Good	-	-
115	STQ	Metal	516236	6680819	25/11/2020	-	-	-	Good	-	-
116	Pos	Ply	516194	6680814	25/11/2020	-	Petaurid spp.	-	Good	-	-
117	A	Ply	516225	6680820	25/11/2020	-	Antechinus spp.	-	Good	-	-
118	GLF	Ply	516229	6680826	25/11/2020	Squirrel glider	-	-	Good	-	Fleed box
119	B1	Ply	516240	6680885	25/11/2020	Aboreal Ants	-	Active ants nest	Good	-	-
120	SmP	Hardwood	516266	6680758	25/11/2020	-	Old leaf	-	Good	-	-
121	BTP	Metal	516324	6680564	25/11/2020	-	Treecreeper spp.	-	Good	-	-
122	Cock_Owl	Ply	516241	6680854	25/11/2020	Common brushtail possum	-	-	Good	-	Climber
123	Pos	Metal	516241	6680854	25/11/2020	-	-	-	Good	-	Climber
124	GLF	Metal	516083	6680903	25/11/2020	-	-	-	Good	-	-
125	TC	Hardwood	516070	6680914	25/11/2020	-	Old leaf	-	Good	-	-
126	GLF	Metal	516560	6680278	27/11/2020	-	Antechinus spp.	-	Good	-	-
127	Cock_Owl	Metal	516588	6680243	27/11/2020	-	-	Wasps nest	Good	-	-
128	Pos	Metal	516588	6680243	27/11/2020	-	-	-	Good	-	-
129	BTP	Ply	516693	6680109	27/11/2020	-	Old leaf	-	Good	-	-
130	SmP	Metal	516708	6680092	27/11/2020	-	Petaurid spp.	-	Good	-	-
131	GLF	Ply	516709	6679838	13/11/2020	Squirrel glider	-	-	Good	-	-
132	BTP	Ply	516515	6680068	13/11/2020	-	Petaurid spp.	-	Good	-	-

Box ID	Box	Material	Easting	Northing	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintenance	Comments
133	TC	Hardwood	516531	6680059	13/11/2020	-	Petaurid spp.	-	Good	-	-
134	TC	Hardwood	518260	6676929	26/11/2020	-	Antechinus spp.	-	Good	-	-

Appendix B–Section 2 nest box monitoring data 2020-21.

Table B1: Section 2 (W2HC) autumn and spring nest box monitoring data 2020-2021.

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
0	Scansorial mammal	Plywood	505169	6697284	21/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
0	Possum	Plywood	505219	6695277	23/04/2021	Lace monitor	-	-	Good	N/A	-
0	Scansorial mammal	Plywood	505314	6695169	23/04/2021		Petaurid spp.	-	Good	N/A	-
0	Scansorial mammal	Plywood	505915	6693508	26/04/2021		Australian owl nightjar	-	Good	N/A	-
1	Scansorial mammal	Plywood	505035	6697588	21/04/2021		Antechinus spp.	-	Good	N/A	-
2	Scansorial mammal	Plywood	505069	6697564	21/04/2021		Antechinus spp.	-	Good	N/A	-
3	Small glider	Plywood	505067	6697540	21/04/2021	Lace monitor	-	-	Good	N/A	-
4	Possum	Plywood	505123	6697561	21/04/2021		Australian owl nightjar	-	Good	N/A	-
5	Large parrot	Plywood	505158	6697591	24/06/2021		-	-	Good	N/A	Climber/can use go pro difficult
6	Scansorial mammal	Plywood	505203	6697632	Not inspected	Not inspected	Not inspected	Not inspected	Severe	-	Burnt
7	Large owl	Plywood	505206	6697492	21/04/2021		-	-	Good	N/A	-
8	Small glider	Plywood	505229	6697501	21/04/2021		Australian owl nightjar	-	Good	N/A	-
9	Small parrot	Plywood	505125	6697449	21/04/2021	<i>Litoria peronii</i>	-	-	Good	N/A	-
10	Small glider	Plywood	505158	6697398	21/04/2021		Petaurid spp.	-	Good	N/A	-
11	Scansorial mammal	Plywood	505082	6697389	21/04/2021		Antechinus spp.	-	Good	N/A	-
12	Small parrot	Plywood	505136	6697411	21/04/2021		Petaurid spp.	-	Good	N/A	-
13	Possum	Plywood	505136	6697327	21/04/2021	Lace monitor	-	-	Good	N/A	-
14	Small owl	Plywood	505128	6697253	21/04/2021		Trichosurus spp.	-	Good	N/A	-
15	Small parrot	Plywood	505132	6697224	21/04/2021		-	-	Good	N/A	-
16	Scansorial mammal	Plywood	505144	6697281	21/04/2021	Aboreal Ants	-	Active ants nest	Good	N/A	-
17	Possum	Plywood	505154	6697291	21/04/2021		-	-	Good	N/A	-
18	Large owl	Plywood	505151	6697152	24/06/2021		-	-	Good	N/A	Climber
19	Small parrot	Plywood	505214	6697057	20/04/2021		Petaurid spp.	-	Good	N/A	-
20	Scansorial mammal	Plywood	505231	6697008	20/04/2021		Old leaf	-	Good	N/A	-
21	Scansorial mammal	Plywood	505250	6697012	20/04/2021		Petaurid spp.	-	Good	N/A	-
22	Large parrot	Plywood	505238	6696966	24/06/2021		Trichosurus spp.	-	Good	N/A	Climber
23	Small glider	Plywood	505295	6696886	20/04/2021		Old leaf	-	Good	N/A	-
24	Small parrot	Plywood	505292	6696850	20/04/2021		-	-	Good	N/A	-
25	Scansorial mammal	Plywood	505295	6696834	20/04/2021		Old leaf	-	Good	N/A	-
26	Small owl	Plywood	505236	6696776	20/04/2021		-	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
27	Small parrot	Plywood	505254	6696762	20/04/2021		-	-	Good	N/A	-
28	Scansorial mammal	Plywood	505264	6696624	20/04/2021		Acrobates spp.	-	Good	N/A	-
29	Small parrot	Plywood	505280	6696605	20/04/2021		-	-	Good	N/A	-
30	Small parrot	Plywood	505299	6696507	20/04/2021		Petaurid spp.	-	Good	N/A	-
31	Small parrot	Plywood	505277	6696487	20/04/2021		Rodent spp.	-	Good	N/A	-
32	Small owl	Plywood	505329	6696462	20/04/2021		-	-	Good	N/A	-
33	Scansorial mammal	Plywood	505274	6696421	20/04/2021		Petaurid spp.	-	Good	N/A	-
34	Small glider	Plywood	505299	6696394	20/04/2021		Petaurid spp.	-	Good	N/A	-
35	Small owl	Plywood	505293	6696372	20/04/2021		-	-	Good	N/A	-
36	Small parrot	Plywood	505264	6696302	20/04/2021		European Bees	Active euro beehive	Good	N/A	-
37	Possum	Plywood	505312	6696046	20/04/2021		Old leaf	-	Good	N/A	-
38	Large parrot	Plywood	505735	6694906	26/04/2021		Petaurid spp.	-	Good	N/A	-
39	Scansorial mammal	Plywood	505540	6695383	26/04/2021		Old leaf	-	Good	N/A	-
40	Large owl	Plywood	505527	6695268	24/06/2021		-	-	Good	Broken at hinge can repair next check	Climber
41	Scansorial mammal	Plywood	505581	6695209	26/04/2021		Acrobates spp.	-	Good	N/A	-
42	Possum	Plywood	505591	6695182	26/04/2021		Antechinus spp.	-	Good	N/A	-
43	Scansorial mammal	Plywood	505624	6695165	26/04/2021		White-throated nightjar	-	Good	N/A	-
44	Scansorial mammal	Plywood	505694	6695111	26/04/2021		Petaurid spp.	-	Good	N/A	-
45	Small parrot	Plywood	505695	6695049	26/04/2021	Lace monitor	-	-	Good	N/A	-
46	Scansorial mammal	Plywood	505786	6694953	26/04/2021		Petaurid spp.	-	Good	N/A	-
47	Large glider	Plywood	505805	6695009	26/04/2021		Petaurid spp.	-	Good	N/A	-
48	Scansorial mammal	Plywood	505844	6694908	26/04/2021		Antechinus spp.	-	Good	N/A	-
49	Large glider	Plywood	505744	6694872	26/04/2021		-	-	Good	N/A	-
50	Scansorial mammal	Plywood	505862	6694871	26/04/2021		Petaurid spp.	-	Good	N/A	-
51	Small parrot	Plywood	505876	6693657	26/04/2021		Petaurid spp.	-	Good	N/A	-
53	Large owl	Plywood	505933	6693740	25/06/2021	Common brushtail possum	-	-	Good	Broken at hinge can repair next check	Climber
54	Small parrot	Plywood	505964	6693770	26/04/2021		-	-	Good	N/A	-
55	Small parrot	Plywood	505931	6693767	26/04/2021		Petaurid spp.	-	Good	N/A	-
56	Scansorial mammal	Plywood	505835	6693707	21/04/2021		Acrobates spp.	-	Good	N/A	-
57	Large parrot	Plywood	505973	6693663	21/04/2021		Trichosurus spp.	-	Fair	N/A	-
58	Small parrot	Plywood	505992	6693660	21/04/2021		-	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
59	Small owl	Plywood	505973	6693707	26/04/2021		-	-	Good	N/A	-
60	Scansorial mammal	Plywood	505996	6693719	26/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
61	Large glider	Cyplas	506025	6693689	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Burnt. Newly installed box moved south west need to change co-ordinates
62	Small owl	Plywood	505968	6693615	26/04/2021		-	-	Good	N/A	-
63	Scansorial mammal	Plywood	505934	6693611	26/04/2021		Antechinus spp.	-	Good	N/A	-
64	Large parrot	Plywood	505995	6693591	11/11/2020	Lace monitor	-	-	Good	N/A	-
65	Scansorial mammal	Plywood	505938	6693576	26/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
66	Large parrot	Plywood	505891	6693543	26/04/2021		Trichosurus spp.	-	Good	N/A	-
67	Small owl	Plywood	505919	6693450	26/04/2021		-	-	Good	N/A	-
68	Scansorial mammal	Plywood	505977	6693471	21/04/2021		Antechinus spp.	-	Hinges and lid need replacing	Hinges and lid need replacing	-
69	Small owl	Plywood	505973	6693487	26/04/2021		-	-	Good	N/A	-
70	Scansorial mammal	Plywood	505982	6693436	26/04/2021		Trichosurus spp.	-	Good	N/A	-
71	Large parrot	Plywood	506037	6693400	26/04/2021		Trichosurus spp.	-	Good	N/A	-
72	Scansorial mammal	Plywood	506013	6693366	26/04/2021		Antechinus spp.	-	Good	N/A	-
73	Scansorial mammal	Plywood	505972	6693355	26/04/2021		-	Old wasps nest	Good	N/A	-
74	Scansorial mammal	Plywood	505947	6693348	26/04/2021		Antechinus spp.	-	Good	N/A	-
75	Large owl	Plywood	505950	6693301	24/06/2021		-	-	Good	N/A	Climber
76	Small parrot	Plywood	505989	6693258	26/04/2021		-	-	Good	N/A	-
77	Small parrot	Plywood	505983	6693275	26/04/2021		-	-	Good	N/A	-
78	Possum	Plywood	506044	6692929	27/04/2021		-	-	Good	N/A	-
79	Scansorial mammal	Plywood	506027	6692933	27/04/2021		-	-	Good	N/A	-
80	Scansorial mammal	Plywood	506019	6693004	27/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
81	Large owl	Plywood	506067	6692982	27/04/2021		-	-	Good	N/A	-
82	Scansorial mammal	Plywood	506107	6692939	27/04/2021		Antechinus spp.	-	Good	N/A	-
83	Scansorial mammal	Plywood	506085	6692884	27/04/2021		Treecreeper spp.	-	Good	N/A	-
84	Large parrot	Plywood	506072	6692901	27/04/2021		-	-	Good	N/A	-
85	Scansorial mammal	Plywood	506060	6692891	27/04/2021		-	-	Good	N/A	-
86	Scansorial mammal	Aluminium	506124	6692886	27/04/2021		-	-	Good	N/A	-
87	Scansorial mammal	Plywood	506163	6692938	27/04/2021		Antechinus spp.	-	Good	N/A	-
88	Scansorial mammal	Aluminium	506145	6692856		Not inspected	Not inspected	Not inspected	-	-	Box on ground, box completely broken, need new box
89	Scansorial mammal	Aluminium	506168	6692833	27/04/2021		-	Old wasps nest	Good	N/A	-
90	Scansorial mammal	Aluminium	506129	6692821	27/04/2021		-	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
91	Large parrot	Aluminium	506097	6692803	27/04/2021	Yellow-bellied glider	-	-	Good	N/A	-
92	Scansorial mammal	Aluminium	506156	6692776	27/04/2021		-	-	Good	N/A	-
93	Scansorial mammal	Aluminium	506178	6692803	27/04/2021		-	-	Good	N/A	-
94	Possum	Aluminium	506193	6692752	27/04/2021		Petaurid spp.	-	Good	N/A	-
95	Scansorial mammal	Aluminium	506203	6692717	27/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
96	Possum	Aluminium	506174	6692724	27/04/2021		-	Old wasps nest	Good	N/A	-
97	Large parrot	Aluminium	506232	6692758	24/06/2021		Yellow-bellied glider	-	Good	N/A	Climber
98	Scansorial mammal	Aluminium	506252	6692742	27/04/2021		-	-	Good	N/A	-
99	Small parrot	Aluminium	506251	6692704	27/04/2021		-	Old wasp nest	Good	N/A	-
100	Scansorial mammal	Aluminium	506209	6692659	27/04/2021		-	-	Good	N/A	velcroe sticky removed used a climber/ Wont require in future
101	Scansorial mammal	Aluminium	506197	6692614	27/04/2021		-	-	Good	N/A	-
102	Large owl	Aluminium	506264	6692609	24/06/2021		-	-	Good	Broken at hinge can repair next check	Climber
103	Small owl	Plywood	506851	6690166	27/04/2021		Trichosurus spp.	-	Good	N/A	-
104	Small glider	Plywood	506887	6690153	27/04/2021		-	-	Good	N/A	Large wood shavings
105	Large parrot	Aluminium	506881	6690152	27/04/2021		Trichosurus spp.	-	Good	N/A	-
106	Small parrot	Aluminium	506865	6690156	27/04/2021		-	-	Good	N/A	-
107	Small parrot	Aluminium	506863	6690148	27/04/2021		Petaurid spp.	-	Good	N/A	-
108	Small glider	Plywood	506903	6690138	27/04/2021		-	-	Good	N/A	Large wood shavings
109	Large parrot	Plywood	506895	6690132	27/04/2021		Trichosurus spp.	-	Good	N/A	-
110	Scansorial mammal	Plywood	506858	6690177	27/04/2021		Antechinus spp.	-	Good	N/A	Small mammal not aluminium possum
118	Large glider	Plywood	509145	6688158	22/04/2021		Petaurid spp.	-	Good	N/A	-
119	Small parrot	Plywood	509171	6688175	22/04/2021		Antechinus spp.	-	Good	N/A	-
120	Scansorial mammal	Plywood	509121	6688169	22/04/2021	Squirrel glider	-	-	Good	N/A	-
121	Scansorial mammal	Plywood	509083	6688161	22/04/2021		Antechinus spp.	-	Good	N/A	-
122	Small owl	Plywood	509065	6688224	22/04/2021		Old leaf	-	Good	N/A	-
123	Large parrot	Plywood	508797	6688418	22/04/2021		Trichosurus spp.	-	Good	N/A	-
124	Scansorial mammal	Plywood	508703	6688453	22/04/2021		Petaurid spp.	-	Good	N/A	-
125	Small parrot	Plywood	508611	6688488	22/04/2021		-	-	Good	N/A	-
126	Large owl	Plywood	508591	6688566	22/04/2021		-	-	Good	N/A	-
127	Large owl	Plywood	508376	6689023	22/04/2021		Trichosurus spp.	-	Good	N/A	Large owl box
128	Possum	Plywood	508393	6689003	22/04/2021		Trichosurus spp.	-	Good	N/A	-
129	Scansorial	Plywood	508409	6688986	22/04/2021	Petaurid	-	-	-	No	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
	mammal					spp.					
130	Scansorial mammal	Plywood	508431	6688944	22/04/2021		Antechinus spp.	-	Good	N/A	-
131	Small owl	Plywood	508519	6688874	22/04/2021		Trichosurus spp.	-	Good	N/A	-
132	Small parrot	Plywood	508544	6688843	22/04/2021	Common brushtail possum	-	-	Good	N/A	-
133	Small glider	Plywood	508621	6688848	22/04/2021		Petaurid spp.	-	Good	N/A	-
134	Large owl	Plywood	505226	6695187	23/04/2021		Trichosurus spp.	-	Good	N/A	-
135	Scansorial mammal	Plywood	505267	6695115	23/04/2021		Petaurid spp.	-	Good	N/A	-
136	Small glider	Plywood	505315	6695056	23/04/2021		Antechinus spp.	-	Good	N/A	Hole 3-4cm, not large glider maybe small mamm or glider pic 1126
137	Scansorial mammal	Plywood	505362	6695039	23/04/2021		-	-	Good	N/A	Hole quite small approx. 5cm, not possum? Pic 1103 20/4 on my phone
138	Scansorial mammal	Plywood	505384	6695091	23/04/2021		Petaurid spp.	-	Good	N/A	-
139	Scansorial mammal	Plywood	505367	6695069	23/04/2021		-	-	Good	N/A	Cuts at front, parrot box? 5cm, pic 1114
140	Scansorial mammal	Plywood	505342	6695070	23/04/2021		Antechinus spp.	-	Good	N/A	-
141	Large glider	Plywood	505402	6695026	23/04/2021		Petaurid spp.	-	Lid rotten	Need new lid	Actually rear entry Large glider
142	Small glider	Plywood	505379	6694992	23/04/2021		Petaurid spp.	-	Good	N/A	-
143	Scansorial mammal	Plywood	505453	6694971	23/04/2021		Petaurid spp.	-	Good	N/A	-
144	Scansorial mammal	Plywood	505346	6695108	23/04/2021		Antechinus spp.	-	Good	N/A	-
145	Small parrot	Plywood	505217	6695152	23/04/2021		Petaurid spp.	-	Good	N/A	Not aluminium
146	Large parrot	Plywood	505188	6695245	23/04/2021		-	-	Good	N/A	-
147	Small parrot	Aluminium	505241	6695250	23/04/2021		-	-	Good	N/A	-
148	Small parrot	Aluminium	505162	6695221	23/04/2021	Lace monitor	-	-	Good	N/A	-
149	Small owl	Aluminium	505148	6695284	23/04/2021		-	Old mud wasp nest	Good	N/A	Smae as 152 also aluminium
150	Scansorial mammal	Aluminium	505177	6695299	23/04/2021		-	-	Good	N/A	-
151	Small parrot	Aluminium	505183	6695339	23/04/2021		-	Mud wasp nest	Good	N/A	-
152	Possum	Aluminium	505178	6695360	23/04/2021		Petaurid spp.	-	Good	N/A	Hole about 7cm aluminium,1309
153	Small owl	Plywood	505156	6695370	23/04/2021		-	-	Good	N/A	Front entrance big box
154	Large parrot	Plywood	505111	6695403	23/04/2021		-	-	Good	N/A	-
155	Scansorial mammal	Plywood	505144	6695426	23/04/2021		-	-	Good	N/A	-
156	Scansorial mammal	Plywood	505192	6695431	23/04/2021		-	-	Good	N/A	Cuts at front, 5cm
157	Scansorial mammal	Cyplas	505043	6696232	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	New box installed
158	Scansorial mammal	Cyplas	505058	6696270	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Box burnt
159	Scansorial	Plywood	505034	6696119	23/04/2021		Acrobates	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
	mammal						spp.				
160	Scansorial mammal	Plywood	505044	6696111	23/04/2021		Petaurid spp.	-	Good	N/A	-
161	Scansorial mammal	Plywood	505024	6696073	12/11/2020		Acrobates spp.	-	Good	N/A	-
162	Large owl	Plywood	505085	6695991	24/06/2021	Common brushtail possum	-	-	Good	N/A	Climber
163	Scansorial mammal	Plywood	505053	6695935	23/04/2021		-	Old ant material	Good	N/A	-
164	Small glider	Plywood	505053	6697656	21/04/2021		-	-	Good	N/A	-
165	Small owl	Plywood	505000	6697649	21/04/2021		-	-	Good	N/A	-
166	Large parrot	Plywood	504992	6697692	Not inspected		-	Not inspected	Unknown	-	Could not find on burn inspection may be wrong co-ordinates or different box
167	Small owl	Plywood	505031	6697691	21/04/2021	Common brushtail possum	-	-	Good	N/A	plastic melted on wire after fire
168	Small parrot	Plywood	505035	6697714	21/04/2021		Petaurid spp.	-	Good	N/A	-
169	Microbat	Plywood	505013	6697718	21/04/2021		-	-	Good	N/A	-
170	Microbat	Plywood	504951	6697709	21/04/2021		-	-	Good	N/A	-
171	Small glider	Plywood	504977	6697706	21/04/2021		-	-	-	-	-
172	Large owl	Cyplas	504929	6697723	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Fleed, Burnt following inventory check
173	Large parrot	Plywood	504961	6697663	21/04/2021		Trichosurus spp.	-	Good	N/A	-
174	Large parrot	Plywood	504950	6697619	21/04/2021		Trichosurus spp.	-	Good	N/A	-
175	Small parrot	Plywood	504944	6697677	21/04/2021		Australian owlet nightjar	-	Good	N/A	-
176	Small glider	Plywood	504982	6697689	21/04/2021		-	-	Good	N/A	-
177	Small parrot	Plywood	504876	6697720	21/04/2021		-	Ant material	Good	N/A	-
178	Small owl	Plywood	504856	6697686	21/04/2021		Australian owlet nightjar	-	Good	N/A	-
179	Small owl	Plywood	504916	6697694	21/04/2021	Common brushtail possum	-	-	Good	N/A	-
180	Small owl	Plywood	505117	6697642	21/04/2021		Trichosurus spp.	-	Good	N/A	-
181	Small parrot	Plywood	505007	6697644	21/04/2021		Petaurid spp.	-	Good	N/A	Actually Approx 8cm SmP box
182	Small glider	Plywood	505786	6694325	26/04/2021		-	-	Good	N/A	-
183	Small owl	Plywood	505799	6694301	26/04/2021		Australian owlet nightjar	-	Good	N/A	-
184	Small glider	Plywood	505804	6694212	26/04/2021		Petaurid spp.	-	Good	N/A	-
185	Small glider	Plywood	505810	6694249	26/04/2021		Brush-tailed Phascogale	-	Good	N/A	-
186	Scansorial mammal	Plywood	505788	6694293	26/04/2021		Antechinus spp.	-	Good	N/A	-
187	Scansorial mammal	Plywood	505815	6694253	26/04/2021		Petaurid spp.	-	Good	N/A	-
188	Large parrot	Plywood	505782	6694320	26/04/2021		Trichosurus spp.	-	Good	N/A	-
189	Scansorial mammal	Plywood	505831	6694324	26/04/2021		Acrobates spp.	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
190	Scansorial mammal	Plywood	505801	6694366	26/04/2021		Antechinus spp.	-	Good	N/A	-
191	Scansorial mammal	Plywood	505815	6694354	26/04/2021		Antechinus spp.	-	Good	N/A	-
192	Small owl	Plywood	505825	6694362	26/04/2021		Trichosurus spp.	-	Good	N/A	-
193	Possum	Plywood	505854	6694365	26/04/2021		-	-	Good	N/A	-
194	Scansorial mammal	Plywood	505862	6694368	26/04/2021		-	-	Good	N/A	-
195	Scansorial mammal	Plywood	505849	6694374	26/04/2021		Antechinus spp.	-	Good	N/A	-
196	Scansorial mammal	Plywood	505834	6694381	26/04/2021		Old leaf	-	Good	N/A	-
197	Possum	Plywood	508490	6688936	22/04/2021	Common brushtail possum	-	-	Good	N/A	-
198	Small glider	Plywood	508496	6688903	22/04/2021		-	-	Good	N/A	Wood chips
199	Small owl	Plywood	508474	6688919	22/04/2021	Aboreal Ants	-	Active ants nest	Lid missing	Need new lid and hinges	-
200	Scansorial mammal	Plywood	508499	6688888	22/04/2021	Aboreal Ants	-	Active ants	Good	N/A	-
201	Microbat	Plywood	508502	6688901	22/04/2021	Aboreal Ants	-	Active ants nest	Good	N/A	-
202	Scansorial mammal	Plywood	508461	6688935	22/04/2021	Aboreal Ants	-	Active ants nest	Good	N/A	-
203	Scansorial mammal	Plywood	508528	6688898	22/04/2021	Squirrel glider	-	-	Good	N/A	-
204	Large parrot	Plywood	504966	6697070	23/04/2021		-	-	Good	N/A	-
205	Large parrot	Plywood	504946	6697027	23/04/2021		-	-	Good	N/A	-
206	Possum	Plywood	504967	6697041	23/04/2021		-	-	Good	N/A	Possum box, large opening
207	Scansorial mammal	Plywood	504993	6696970	23/04/2021		Antechinus spp.	-	Good	N/A	-
208	Scansorial mammal	Cyplas	504986	6696928	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Burnt
209	Microbat	Plywood	504949	6696994	23/04/2021		-	-	Good	N/A	-
210	Small glider	Cyplas	504991	6697016	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Burnt
211	Small glider	Plywood	504996	6697063	23/04/2021		-	-	Good	N/A	-
212	Scansorial mammal	Cyplas	504992	6697081	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Cant find pr burnt
213	Possum	Plywood	504992	6697062	23/04/2021		-	-	Good	N/A	-
214	Scansorial mammal	Plywood	504972	6697062	23/04/2021		Petaurid spp.	-	Good	N/A	-
215	Small parrot	Plywood	504959	6697049	23/04/2021		-	-	Good	N/A	-
216	Small parrot	Aluminium	504880	6696955	23/04/2021		-	-	Good	N/A	Co-ordinates changed 504920.6697115
217	Microbat	Plywood	504920	6697107	23/04/2021		Microbat spp.	-	Good	N/A	-
218	Small parrot	Plywood	504956	6697150	23/04/2021	Australian owl nightjar	-	-	Good	N/A	-
219	Small owl	Plywood	505630	6693987	23/04/2021		Trichosurus spp.	-	Good	N/A	-
220	Small glider	Plywood	505648	6693962	23/04/2021		-	-	Good	N/A	Big wood chips

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221	Scansorial mammal	Plywood	505623	6693948	23/04/2021		Trichosurus spp.	-	Good	N/A	-
222	Scansorial mammal	Plywood	505618	6693955	Not inspected		-	Not inspected	Severe	-	-
223	Microbat	Plywood	505616	6693994	23/04/2021		-	-	Good	N/A	-
224	Large parrot	Plywood	505607	6694041	23/04/2021		-	-	Good	N/A	-
225	Small parrot	Plywood	504975	6697139	23/04/2021		-	-	Good	N/A	-
226	Small glider	Plywood	504933	6697175	23/04/2021		Petaurid spp.	-	Good	N/A	-
227	Small glider	Plywood	504959	6697170	23/04/2021		-	-	Good	N/A	Bark shavings
228	Scansorial mammal	Plywood	504935	6697187	23/04/2021		-	-	Good	N/A	-
229	Scansorial mammal	Cyplas	504937	6697214	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Box w small as entrance not small mammal, Burnt after inspection
230	Possum	Cyplas	504942	6697234	Not inspected	Not inspected	Not inspected	Not inspected	Severe	New Box installed	Burnt after inspection
231	Possum	Plywood	504917	6697226	23/04/2021		-	-	Good	N/A	-
232	Possum	Plywood	504896	6697256	23/04/2021		-	-	Good	N/A	-
233	Scansorial mammal	Plywood	504893	6697200	23/04/2021	Common brushtail possum	-	-	Good	N/A	-
234	Large parrot	Plywood	509559	6687985	22/04/2021		Trichosurus spp.	-	Good	N/A	-
235	Small owl	Plywood	509540	6688009	22/04/2021	Common brushtail possum	-	-	Good	N/A	-
236	Possum	Plywood	509551	6687973	22/04/2021		Petaurid spp.	-	Good	N/A	-
237	Possum	Plywood	509579	6687921	22/04/2021		-	-	Good	N/A	Wood shavings
238	Scansorial mammal	Plywood	509644	6687879	22/04/2021	Aboreal Ants	-	Active ants nest	Good	N/A	-
239	Large parrot	Plywood	509632	6687863	22/04/2021		Trichosurus spp.	-	Good	N/A	-
240	Scansorial mammal	Plywood	509641	6687851	22/04/2021		Petaurid spp.	-	Good	N/A	-
241	Large parrot	Plywood	509661	6687785	25/06/2021		Trichosurus spp.	-	Good	N/A	Climber
242	Small owl	Plywood	509683	6687810	22/04/2021		Trichosurus spp.	-	Good	N/A	-
243	Possum	Plywood	509796	6687726	22/04/2021		Antechinus spp.	-	Good	N/A	-
244	Possum	Plywood	509906	6687661	22/04/2021		-	-	Good	N/A	Wood shavings
255	Small owl	Plywood	509922	6687584	22/04/2021		Antechinus spp.	-	Good	N/A	-
256	Small glider	Plywood	510006	6687555	22/04/2021		Antechinus spp.	-	Good	N/A	Wood shavings
257	Scansorial mammal	Plywood	509977	6687558	22/04/2021		Old leaf	-	Good	N/A	-
258	Scansorial mammal	Plywood	510021	6687514	22/04/2021		Acrobates spp.	-	Good	N/A	-
259	Scansorial mammal	Plywood	510020	6687516	22/04/2021		-	Old euro beehive	Good	N/A	-
260	Scansorial mammal	Plywood	510027	6687506	22/04/2021		Antechinus spp.	-	Good	N/A	-
261	Scansorial mammal	Plywood	510006	6687555	22/04/2021		Australian owl nightjar	-	Good	N/A	-

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262	Scansorial mammal	Plywood	509909	6687621	22/04/2021		-	Old ant materia l	Good	N/A	-
263	Scansorial mammal	Plywood	509904	6687619	22/04/2021		Treecreeper spp.	-	Good	N/A	-
240 A	Microbat	Cyplas	504785	6697495	22/04/2021		-	-	-	-	Actually a bat box
345	Scansorial mammal	Cyplas	504783	6697492	22/04/2021		-	-	-	-	-
353	Small parrot	Cyplas	504791	6697479	Not inspected		-			-	-
0	Scansorial mammal	Plywood	505169	6697284	9/11/2020		Petaurid spp.	-	Good	N/A	-
0	Possum	Plywood	505915	6693508	11/11/2020		Antechinus spp.	-	Good	N/A	-
0	Scansorial mammal	Plywood	505314	6695169	12/11/2020		Petaurid spp.	-	Good	N/A	-
0	Scansorial mammal	Plywood	505219	6695277	12/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
1	Scansorial mammal	Plywood	505035	6697588	9/11/2020		Australian owlet nightjar	-	Good	N/A	-
2	Scansorial mammal	Plywood	505069	6697564	9/11/2020		Petaurid spp.	-	Good	N/A	-
3	Small glider	Plywood	505067	6697540	9/11/2020		-	Old ant nest	Good	N/A	-
4	Possum	Plywood	505123	6697561	9/11/2020		Old leaf	-	Good	N/A	-
5	Large parrot	Plywood	505158	6697591	9/11/2020		-	-	Good	N/A	-
6	Scansorial mammal	Plywood	505203	6697632	9/11/2020		Acrobates spp.	-	Good	N/A	-
7	Large owl	Plywood	505206	6697492	9/11/2020		-	-	Good	N/A	-
8	Small glider	Plywood	505229	6697501	9/11/2020	Australian owlet nightjar	-	-	Good	N/A	-
9	Small parrot	Plywood	505125	6697449	9/11/2020		Trichosurus spp.	-	Good	N/A	-
10	Small glider	Plywood	505158	6697398	9/11/2020		Petaurid spp.	-	Good	N/A	-
11	Scansorial mammal	Plywood	505082	6697389	9/11/2020		Antechinus spp.	-	Good	N/A	-
12	Small parrot	Plywood	505136	6697411	9/11/2020		Petaurid spp.	-	Good	N/A	-
13	Possum	Plywood	505136	6697327	9/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
14	Small owl	Plywood	505128	6697253	9/11/2020	Common brushtail possum	-	-	Good	N/A	-
15	Small parrot	Plywood	505132	6697224	9/11/2020		-	-	Good	N/A	-
16	Scansorial mammal	Plywood	505144	6697281	9/11/2020		-	-	Good	N/A	-
17	Possum	Plywood	505154	6697291	9/11/2020		Bird spp.	-	Good	N/A	-
18	Large owl	Plywood	505151	6697152	10/11/2020		-	-	Good	N/A	Climber
19	Small parrot	Plywood	505214	6697057	10/11/2020		Petaurid spp.	-	Good	N/A	-
20	Scansorial mammal	Plywood	505231	6697008	10/11/2020	Australian owlet nightjar	-	-	Good	N/A	-
21	Scansorial mammal	Plywood	505250	6697012	10/11/2020		Old leaf	-	Good	N/A	-
22	Large parrot	Plywood	505238	6696966	10/11/2020		Trichosurus spp.	-	Good	N/A	Climber
23	Small glider	Plywood	505295	6696886	10/11/2020		Old leaf	-	Good	N/A	-

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24	Small parrot	Plywood	505292	6696850	10/11/2020		-	-	Good	N/A	-
25	Scansorial mammal	Plywood	505295	6696834	10/11/2020		Acrobates spp.	-	Good	N/A	-
26	Small owl	Plywood	505236	6696776	10/11/2020		-	-	Good	N/A	-
27	Small parrot	Plywood	505254	6696762	10/11/2020		-	-	Good	N/A	-
28	Scansorial mammal	Plywood	505264	6696624	10/11/2020		Petaurid spp.	-	Good	N/A	-
29	Small parrot	Plywood	505280	6696605	10/11/2020		-	-	Good	N/A	-
30	Small parrot	Plywood	505299	6696507	10/11/2020		Old leaf	-	Good	N/A	-
31	Small parrot	Plywood	505277	6696487	10/11/2020		-	-	Good	N/A	-
32	Small owl	Plywood	505329	6696462	10/11/2020		-	-	Good	N/A	-
33	Scansorial mammal	Plywood	505274	6696421	10/11/2020		Petaurid spp.	-	Good	N/A	-
34	Small glider	Plywood	505299	6696394	10/11/2020		Petaurid spp.	-	Good	N/A	-
35	Small owl	Plywood	505293	6696372	10/11/2020	Common brushtail possum	-	-	Good	N/A	-
36	Small parrot	Plywood	505264	6696302	10/11/2020		-	-	Good	N/A	-
37	Possum	Plywood	505312	6696046	10/11/2020		Old leaf	-	Good	N/A	-
38	Large parrot	Plywood	505735	6694906	10/11/2020		-	-	Good	N/A	-
39	Scansorial mammal	Plywood	505540	6695383	10/11/2020		Antechinus spp.	-	Good	N/A	-
40	Large owl	Plywood	505527	6695268	10/11/2020		-	-	Good	N/A	Climber
41	Scansorial mammal	Plywood	505581	6695209	10/11/2020		Petaurid spp.	-	Good	N/A	-
42	Possum	Plywood	505591	6695182	10/11/2020		Trichosurus spp.	-	Good	N/A	-
43	Scansorial mammal	Plywood	505624	6695165	10/11/2020		White-throated nightjar	-	Good	N/A	-
44	Scansorial mammal	Plywood	505694	6695111	10/11/2020		Petaurid spp.	-	Good	N/A	-
45	Small parrot	Plywood	505695	6695049	10/11/2020	Australian owlet nightjar	-	-	Good	N/A	-
46	Scansorial mammal	Plywood	505786	6694953	10/11/2020		Petaurid spp.	-	Good	N/A	-
47	Large glider	Plywood	505805	6695009	10/11/2020		Trichosurus spp.	-	Good	N/A	-
48	Scansorial mammal	Plywood	505844	6694908	10/11/2020		Petaurid spp.	-	Good	N/A	-
49	Large glider	Plywood	505744	6694872	10/11/2020		-	-	Good	N/A	-
50	Scansorial mammal	Plywood	505862	6694871	10/11/2020		Petaurid spp.	-	Good	N/A	-
51	Small parrot	Plywood	505876	6693657	11/11/2020		Petaurid spp.	-	Good	N/A	-
53	Large owl	Plywood	505933	6693740	11/11/2020	Common brushtail possum	-	-	Good	N/A	Climber
54	Small parrot	Plywood	505964	6693770	11/11/2020		-	-	Good	N/A	-
55	Small parrot	Plywood	505931	6693767	11/11/2020		Petaurid spp.	-	Good	N/A	-
56	Scansorial mammal	Plywood	505835	6693707	11/11/2020		Petaurid spp.	-	Good	N/A	-

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57	Large parrot	Plywood	505973	6693663	10/11/2020		Trichosurus spp.	-	Fair	N/A	Tree grown into lid
58	Small parrot	Plywood	505992	6693660	11/11/2020		-	-	Good	N/A	-
59	Small owl	Plywood	505973	6693707	11/11/2020		-	-	Good	N/A	Large glider box front opening box
60	Scansorial mammal	Plywood	505996	6693719	11/11/2020		-	-	Good	N/A	-
61	Large glider	Cyplas	506025	6693689	11/11/2020		-	-	Good	N/A	Burnt
62	Small owl	Plywood	505968	6693615	11/11/2020		-	-	Good	N/A	-
63	Scansorial mammal	Plywood	505934	6693611	11/11/2020		Petaurid spp.	-	Good	N/A	-
64	Large parrot	Plywood	505995	6693591	11/11/2020		-	-	Good	N/A	-
65	Scansorial mammal	Plywood	505938	6693576	11/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
66	Large parrot	Plywood	505891	6693543	11/11/2020		Trichosurus spp.	-	Good	N/A	-
67	Small owl	Plywood	505919	6693450	11/11/2020		-	-	Good	N/A	-
68	Scansorial mammal	Plywood	505977	6693471	11/11/2020		Antechinus spp.	-	Hinges and lid need replacing	Hinges and lid need replacing	-
69	Small owl	Plywood	505973	6693487	11/11/2020	Common brushtail possum	-	-	Good	N/A	-
nn	Scansorial mammal	Plywood	505982	6693436	11/11/2020		Trichosurus spp.	-	Good	N/A	-
71	Large parrot	Plywood	506037	6693400	11/11/2020		Trichosurus spp.	-	Good	N/A	-
72	Scansorial mammal	Plywood	506013	6693366	11/11/2020		Petaurid spp.	-	Good	N/A	-
73	Scansorial mammal	Plywood	505972	6693355	11/11/2020		-	Old wasps nest	Good	N/A	-
74	Scansorial mammal	Plywood	505947	6693348	11/11/2020		Antechinus spp.	-	Good	N/A	-
75	Large owl	Plywood	505950	6693301	11/11/2020		-	-	Good	N/A	Climber
76	Small parrot	Plywood	505989	6693258	11/11/2020		-	-	Good	N/A	-
77	Small parrot	Plywood	505983	6693275	11/11/2020		-	-	Good	N/A	-
78	Possum	Plywood	506044	6692929	11/11/2020		-	-	Good	N/A	-
79	Scansorial mammal	Plywood	506027	6692933	11/11/2020		-	-	Good	N/A	-
80	Scansorial mammal	Plywood	506019	6693004	11/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
81	Large owl	Plywood	506067	6692982	11/11/2020		-	-	Good	N/A	-
82	Scansorial mammal	Plywood	506107	6692939	11/11/2020		Antechinus spp.	-	Good	N/A	-
83	Scansorial mammal	Plywood	506085	6692884	11/11/2020		Petaurid spp.	-	Good	N/A	-
84	Large parrot	Plywood	506072	6692901	11/11/2020		-	-	Good	N/A	-
85	Scansorial mammal	Plywood	506060	6692891	11/11/2020		-	-	Good	N/A	-
86	Scansorial mammal	Aluminium	506124	6692886	11/11/2020		-	-	Good	N/A	-
87	Scansorial mammal	Plywood	506163	6692938	11/11/2020		-	-	Good	N/A	-
88	Scansorial mammal	Aluminium	506145	6692856	11/11/2020	Not inspected	Not inspected	Not inspected	Severe	-	Box on ground, box completely broken, need new box

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89	Scansorial mammal	Aluminium	506168	6692833	11/11/2020		-	Old wasps nest	Good	N/A	-
90	Scansorial mammal	Aluminium	506129	6692821	11/11/2020		-	-	Good	N/A	-
91	Large parrot	Aluminium	506097	6692803	11/11/2020		Old leaf	-	Good	N/A	-
92	Scansorial mammal	Aluminium	506156	6692776	11/11/2020		-	-	Good	N/A	-
93	Scansorial mammal	Aluminium	506178	6692803	11/11/2020		-	-	Good	N/A	-
94	Possum	Aluminium	506193	6692752	11/11/2020		Petaurid spp.	-	Good	N/A	-
95	Scansorial mammal	Aluminium	506203	6692717	11/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
96	Possum	Aluminium	506174	6692724	11/11/2020		-	Old wasps nest	Good	N/A	-
97	Large parrot	Aluminium	506232	6692758	30/11/2020	Yellow-bellied glider	-	-	Good	N/A	Climber
98	Scansorial mammal	Aluminium	506252	6692742	11/11/2020		-	-	Good	N/A	-
99	Small parrot	Aluminium	506251	6692704	11/11/2020		-	Old wasp nest	Good	N/A	-
100	Scansorial mammal	Aluminium	506209	6692659	11/11/2020		-	-	Good	N/A	velcroe sticky removed used a climber/ Wont require in future
101	Scansorial mammal	Aluminium	506197	6692614	11/11/2020		-	-	Good	N/A	-
102	Large owl	Aluminium	506264	6692609	30/11/2020		-	-	Good	N/A	Climber
103	Small owl	Plywood	506851	6690166	11/11/2020		Trichosurus spp.	-	Good	N/A	-
104	Small glider	Plywood	506887	6690153	11/11/2020		-	-	Good	N/A	Large wood shavings
105	Large parrot	Aluminium	506881	6690152	11/11/2020	Common brushtail possum	-	-	Good	N/A	-
106	Small parrot	Aluminium	506865	6690156	11/11/2020		-	-	Good	N/A	-
107	Small parrot	Aluminium	506863	6690148	11/11/2020		Petaurid spp.	-	Good	N/A	-
108	Small glider	Plywood	506903	6690138	11/11/2020		-	-	Good	N/A	Large wood shavings
109	Large parrot	Plywood	506895	6690132	11/11/2020		-	-	Good	N/A	-
110	Scansorial mammal	Plywood	506858	6690177	11/11/2020		Petaurid spp.	-	Good	N/A	Small mammal not aluminium possum
118	Large glider	Plywood	509145	6688158	11/11/2020		Petaurid spp.	-	Good	N/A	-
119	Small parrot	Plywood	509171	6688175	12/11/2020		-	-	Good	N/A	-
120	Scansorial mammal	Plywood	509121	6688169	12/11/2020	Sugar glider	-	-	Good	N/A	-
121	Scansorial mammal	Plywood	509083	6688161	12/11/2020		Treecreeper spp.	-	Good	N/A	-
122	Small owl	Plywood	509065	6688224	11/11/2020		Old leaf	-	Good	N/A	-
123	Large parrot	Plywood	508797	6688418	12/11/2020		-	-	Good	N/A	-
124	Scansorial mammal	Plywood	508703	6688453	11/11/2020		Petaurid spp.	-	Good	N/A	-
125	Small parrot	Plywood	508611	6688488	11/11/2020		-	-	Good	N/A	-
126	Large owl	Plywood	508591	6688566	12/11/2020		-	-	Good	N/A	-
127	Large owl	Plywood	508376	6689023	26/11/2020		Trichosurus	-	Good	N/A	Large owl box

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
							spp.				
128	Possum	Plywood	508393	6689003	26/11/2020		Trichosurus spp.	-	Good	N/A	-
129	Scansorial mammal	Plywood	508409	6688986	26/11/2020	Squirrel glider	-	-	Hinge wear	No	-
130	Scansorial mammal	Plywood	508431	6688944	26/11/2020	Common brushtail possum	-	-	Good	N/A	-
131	Small owl	Plywood	508519	6688874	26/11/2020		Trichosurus spp.	-	Good	N/A	-
132	Small parrot	Plywood	508544	6688843	26/11/2020		Trichosurus spp.	-	Good	N/A	-
133	Small glider	Plywood	508621	6688848	26/11/2020		Petaurid spp.	-	Good	N/A	-
134	Large owl	Plywood	505226	6695187	12/11/2020		-	-	Good	N/A	-
135	Scansorial mammal	Plywood	505267	6695115	12/11/2020		Antechinus spp.	-	Good	N/A	-
136	Small glider	Plywood	505315	6695056	12/11/2020		Trichosurus spp.	-	Good	N/A	-
137	Scansorial mammal	Plywood	505362	6695039	12/11/2020		-	-	Good	N/A	-
138	Scansorial mammal	Plywood	505384	6695091	12/11/2020		Petaurid spp.	-	Good	N/A	-
139	Scansorial mammal	Plywood	505367	6695069	12/11/2020		-	-	Good	N/A	-
140	Scansorial mammal	Plywood	505342	6695070	12/11/2020		Antechinus spp.	-	Good	N/A	-
141	Large glider	Plywood	505402	6695026	12/11/2020		Petaurid spp.	-	Good	N/A	-
142	Small glider	Plywood	505379	6694992	12/11/2020		Petaurid spp.	-	Good	N/A	-
143	Scansorial mammal	Plywood	505453	6694971	12/11/2020		Petaurid spp.	-	Good	N/A	-
144	Scansorial mammal	Plywood	505346	6695108	12/11/2020		Petaurid spp.	-	Good	N/A	-
145	Small parrot	Plywood	505217	6695152	12/11/2020		Petaurid spp.	-	Good	N/A	-
146	Large parrot	Plywood	505188	6695245	12/11/2020		-	-	Good	N/A	-
147	Small parrot	Aluminium	505241	6695250	12/11/2020		-	-	Good	N/A	-
148	Small parrot	Aluminium	505162	6695221	12/11/2020		Petaurid spp.	-	Good	N/A	-
149	Small owl	Aluminium	505148	6695284	12/11/2020		-	Old mud wasp nest	Good	N/A	-
150	Scansorial mammal	Aluminium	505177	6695299	12/11/2020		-	-	Good	N/A	-
151	Small parrot	Aluminium	505183	6695339	12/11/2020		-	Mud wasp nest	Good	N/A	-
152	Possum	Aluminium	505178	6695360	12/11/2020		Petaurid spp.	-	Good	N/A	-
153	Small owl	Plywood	505156	6695370	12/11/2020		-	-	Good	N/A	-
154	Large parrot	Plywood	505111	6695403	12/11/2020		-	-	Good	N/A	-
155	Scansorial mammal	Plywood	505144	6695426	12/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
156	Scansorial mammal	Plywood	505192	6695431	12/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
157	Scansorial mammal	Cyplas	505043	6696232	12/11/2020		-	-	Good	N/A	-
158	Scansorial mammal	Cyplas	505058	6696270	12/11/2020		Acrobates spp.	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
159	Scansorial mammal	Plywood	505034	6696119	12/11/2020		Petaurid spp.	-	Good	N/A	-
160	Scansorial mammal	Plywood	505044	6696111	12/11/2020		Petaurid spp.	-	Good	N/A	-
161	Scansorial mammal	Plywood	505024	6696073	12/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
162	Large owl	Plywood	505085	6695991	12/11/2020	Common brushtail possum	-	-	Good	N/A	Climber
163	Scansorial mammal	Plywood	505053	6695935	12/11/2020		Old leaf	-	Good	N/A	-
164	Small glider	Plywood	505053	6697656	9/11/2020		Brush-tailed Phascogale	-	Good	N/A	-
165	Small owl	Plywood	505000	6697649	9/11/2020		-	-	Good	N/A	-
166	Large parrot	Plywood	504992	6697692	9/11/2020		Old leaf	-	Good	N/A	Could not find on burn inspection may be wrong co-ordinates or different box
167	Small owl	Plywood	505031	6697691	9/11/2020		Old leaf	-	Good	N/A	plastic melted on wire after fire
168	Small parrot	Plywood	505035	6697714	9/11/2020		Petaurid spp.	-	Good	N/A	-
169	Microbat	Plywood	505013	6697718	9/11/2020		-	-	Good	N/A	-
170	Microbat	Plywood	504951	6697709	9/11/2020		-	-	Good	N/A	-
171	Small glider	Plywood	504977	6697706	9/11/2020	Common brushtail possum	-	-	Good	N/A	-
172	Large owl	Cyplas	504929	6697723	9/11/2020	Australian owlet nightjar	-	-	Good	N/A	Fleed, Burnt following inventory check
173	Large parrot	Plywood	504961	6697663	9/11/2020		Trichosurus spp.	-	Good	N/A	-
174	Large parrot	Plywood	504950	6697619	9/11/2020	Common brushtail possum	-	-	Good	N/A	-
175	Small parrot	Plywood	504944	6697677	9/11/2020	Australian owlet nightjar	-	-	Good	N/A	Onj fled, out of position adjusted
176	Small glider	Plywood	504982	6697689	9/11/2020		-	-	Good	N/A	out of position adjusted
177	Small parrot	Plywood	504876	6697720	9/11/2020		-	Ants nest	Good	N/A	-
178	Small owl	Plywood	504856	6697686	9/11/2020		Bird spp.	-	Good	N/A	-
179	Small owl	Plywood	504916	6697694	9/11/2020	Australian owlet nightjar	-	-	Good	N/A	Fleed
180	Small owl	Plywood	505117	6697642	9/11/2020		Old leaf	-	Good	N/A	Could not find, probable burnt
181	Small parrot	Plywood	505007	6697644	9/11/2020		-	-	Good	N/A	-
182	Small glider	Plywood	505786	6694325	10/11/2020		-	-	Good	N/A	-
183	Small owl	Plywood	505799	6694301	10/11/2020		Bird spp.	-	Good	N/A	-
184	Small glider	Plywood	505804	6694212	10/11/2020		Antechinus spp.	-	Good	N/A	-
185	Small glider	Plywood	505810	6694249	10/11/2020		Petaurid spp.	-	Good	N/A	-
186	Scansorial mammal	Plywood	505788	6694293	10/11/2020		Antechinus spp.	-	Good	N/A	-
187	Scansorial mammal	Plywood	505815	6694253	10/11/2020		Old leaf	-	Good	N/A	-
188	Large parrot	Plywood	505782	6694320	10/11/2020		-	-	Good	N/A	-
189	Scansorial mammal	Plywood	505831	6694324	10/11/2020		Petaurid spp.	-	Good	N/A	-
190	Scansorial	Plywood	505801	6694366	10/11/2020		Antechinus	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
	mammal						spp.				
191	Scansorial mammal	Plywood	505815	6694354	10/11/2020		Antechinus spp.	-	Good	N/A	-
192	Small owl	Plywood	505825	6694362	10/11/2020		Trichosurus spp.	-	Good	N/A	-
193	Possum	Plywood	505854	6694365	10/11/2020		-	-	Good	N/A	-
194	Scansorial mammal	Plywood	505862	6694368	10/11/2020		-	-	Good	N/A	-
195	Scansorial mammal	Plywood	505849	6694374	10/11/2020		Old leaf	-	Good	N/A	-
196	Scansorial mammal	Plywood	505834	6694381	10/11/2020		Antechinus spp.	-	Good	N/A	-
197	Possum	Plywood	508490	6688936	26/11/2020		Acrobates spp.	-	Good	N/A	-
198	Small glider	Plywood	508496	6688903	26/11/2020		-	-	Good	N/A	Wood chips
199	Small owl	Plywood	508474	6688919	26/11/2020		Trichosurus spp.	-	Lid missing	Need new lid and hinges	-
200	Scansorial mammal	Plywood	508499	6688888	26/11/2020		Petaurid spp.	-	Good	N/A	-
201	Microbat	Plywood	508502	6688901	26/11/2020		-	-	Good	N/A	-
202	Scansorial mammal	Plywood	508461	6688935	26/11/2020		Petaurid spp.	-	Good	N/A	-
203	Scansorial mammal	Plywood	508528	6688898	26/11/2020	Squirrel glider	-	-	Good	N/A	-
204	Large parrot	Plywood	504966	6697070	13/11/2020		-	-	Good	N/A	-
205	Large parrot	Plywood	504946	6697027	12/11/2020		-	-	Good	N/A	-
206	Possum	Plywood	504967	6697041	12/11/2020		-	-	Good	N/A	Large Wood shavings, requires gps fixing
207	Scansorial mammal	Plywood	504993	6696970	12/11/2020		Petaurid spp.	-	Good	N/A	-
208	Scansorial mammal	Cyplas	504986	6696928	12/11/2020		Petaurid spp.	-	Good	N/A	Burnt
209	Microbat	Plywood	504949	6696994	12/11/2020		-	-	Good	N/A	-
210	Small glider	Cyplas	504991	6697016	12/11/2020		-	-	Good	N/A	Large wood shavings
211	Small glider	Plywood	504996	6697063	12/11/2020		-	-	Good	N/A	-
212	Scansorial mammal	Cyplas	504992	6697081	13/11/2020		-	-	Good	N/A	-
213	Possum	Plywood	504992	6697062	12/11/2020		-	-	Good	N/A	Burnt
214	Scansorial mammal	Plywood	504972	6697062	12/11/2020		Petaurid spp.	-	Good	N/A	-
215	Small parrot	Plywood	504959	6697049	12/11/2020		-	-	Good	N/A	-
216	Small parrot	Aluminium	504880	6696955	12/11/2020		-	-	Good	N/A	Co-ordinates changed 504920.6697115, not aluminium
217	Microbat	Plywood	504920	6697107	13/11/2020		Microbat spp.	-	Good	N/A	-
218	Small parrot	Plywood	504956	6697150	13/11/2020		-	-	Good	N/A	-
219	Small owl	Plywood	505630	6693987	12/11/2020		Trichosurus spp.	-	Good	N/A	-
220	Small glider	Plywood	505648	6693962	12/11/2020		-	-	Good	N/A	Big wood chips
221	Scansorial mammal	Plywood	505623	6693948	12/11/2020		Petaurid spp.	-	Good	N/A	-
222	Scansorial mammal	Plywood	505618	6693955			-	-	Good	N/A	-
223	Microbat	Plywood	505616	6693994	12/11/2020		-	-	Good	N/A	-
224	Large parrot	Plywood	505607	6694041	12/11/2020	Common brushtail	-	-	Good	N/A	-

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
						possum					
225	Small parrot	Plywood	504975	6697139	13/11/2020		-	-	Good	N/A	-
226	Small glider	Plywood	504933	6697175	13/11/2020	Lace monitor	-	-	Good	N/A	-
227	Small glider	Plywood	504959	6697170	13/11/2020		-	-	Good	N/A	Bark shavings
228	Scansorial mammal	Plywood	504935	6697187	13/11/2020		-	-	-	-	Pr burnt, cant find
229	Scansorial mammal	Cyplas	504937	6697214	13/11/2020		Trichosurus spp.	-	Good	N/A	Box w small as entrance not small mammal, Burnt after inspection
230	Possum	Cyplas	504942	6697234	13/11/2020		Trichosurus spp.	-	Good	N/A	Burnt after inspection
231	Possum	Plywood	504917	6697226	21/04/2021		-	-	Good	N/A	-
232	Possum	Plywood	504896	6697256	13/11/2020		-	-	Good	N/A	-
233	Scansorial mammal	Plywood	504893	6697200	13/11/2020		Antechinus spp.	-	Good	N/A	-
234	Large parrot	Plywood	509559	6687985	11/11/2020		Trichosurus spp.	-	Good	N/A	-
235	Small owl	Plywood	509540	6688009	11/11/2020		Trichosurus spp.	-	Good	N/A	-
236	Possum	Plywood	509551	6687973	11/11/2020		Petaurid spp.	-	Good	N/A	-
237	Possum	Plywood	509579	6687921	11/11/2020		-	-	Good	N/A	Wood shavings
238	Scansorial mammal	Plywood	509644	6687879	11/11/2020	Aboreal Ants	-	Active ants nest	Good	N/A	-
239	Large parrot	Plywood	509632	6687863	11/11/2020	Common brushtail possum	-	-	Good	N/A	-
240	Scansorial mammal	Cyplas	509641	6687851	11/11/2020		Petaurid spp.	-	Good	N/A	-
241	Large parrot	Plywood	509661	6687785	11/11/2020		Trichosurus spp.	-	Good	N/A	Climber
242	Small owl	Plywood	509683	6687810	11/11/2020	Common brushtail possum	-	-	Good	N/A	-
243	Possum	Plywood	509796	6687726	11/11/2020		Antechinus spp.	-	Good	N/A	-
244	Possum	Plywood	509906	6687661	11/11/2020		-	-	Good	N/A	Wood shavings
255	Small owl	Plywood	509922	6687584	11/11/2020		Antechinus spp.	-	Good	N/A	-
256	Small glider	Plywood	510006	6687555	11/11/2020		-	-	Good	N/A	Wood shavings
256	Scansorial mammal	Plywood	510006	6687555	11/11/2020	Stephens banded snake	-	-	Good	N/A	-
257	Scansorial mammal	Plywood	509977	6687558	11/11/2020	Aboreal Ants	-	Active Ants nest	Good	N/A	-
258	Scansorial mammal	Plywood	510021	6687514	11/11/2020		Petaurid spp.	Old euro beehive	Good	N/A	-
259	Scansorial mammal	Plywood	510020	6687516	11/11/2020		Antechinus spp.	-	Good	N/A	-
260	Scansorial mammal	Plywood	510027	6687506	11/11/2020		Antechinus spp.	-	Good	N/A	-
262	Scansorial mammal	Plywood	509909	6687621	11/11/2020	Aboreal Ants	-	Active ants nest	Good	N/A	-
263	Scansorial mammal	Plywood	509904	6687619	11/11/2020		Treecreeper spp.	-	Good	N/A	-
240 A	Microbat	Cyplas	504785	6697495		-	-	-	Nil	Nil	Burnt

Box ID	Box	Material	Easting s	Northings	Inspection date	Occupied species	Evidence of use species	Pests	Condition	Maintainence	Comments
345	Scansorial mammal	Cyplas	504783	6697492			-	-	-	-	-
353	Small parrot	Cyplas	504791	6697479	Not inspected	Not inspected	Not inspected	-	Good	-	-
1	Cock_Owl	Ply	517887	6674740			-	-	-	-	Climber Can get with go pro

Appendix C – Chainsaw hollow monitoring data 2020-21.

Table C1: Section 2 (W2HC) autumn and spring chainsaw hollow monitoring data 2020-2021.

Season	Box No.	Easting	Northing	Hollow type	Species present	Evidence of use	Pest species	Box condition	Maintenance	Comments
Spring	700	505647	6693785	Small arboreal mammal	Nil	Feathertail glider nest	Nil	Good	N/A	Chew markings around entrance hole
Spring	701	505642	6693786	Microbat large	Nil	Nil	Nil	Good	N/A	
Spring	702	505638	6693859	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	50Mm entry, pic228
Spring	703	505636	6693859	Microbat small	Nil	Nil	Nil	Good	Removed epicormic growth	Entry is perpendicular
Spring	704	505651	6693907	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	
Spring	705	505648	6693910	Microbat small	Nil	Nil	Nil	Good	N/A	Plunge cut no front
Spring	706	505621	6694013	Med arboreal mammal	Nil	Nil	Nil	Good	Removed epicormic growth	Screws coming off faceplate
Spring	707	505637	6694019	Microbat small	Nil	Nil	Arboreal ants	Good	Ant nest reopened with drill	
Spring	708	505621	6694011	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic1449, plus video,
Spring	709	505620	6694011	Microbat small	Nil	Nil	Nil	Good	N/A	Plunge cut, closing over
Spring	710	504877	6697639	Microbat small	Not inspected	Not inspected	Not inspected			
Spring	710	504877	6697639	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic 1253.
Spring	711	504934	6697707	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt out
Spring	712	504880	6697631	Med arboreal mammal	Nil	Scattered leaf (unid)	Nil	Good	N/A	Pic 1248
Spring	713	504879	6697631	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt out
Spring	714	504843	6697719	Med arboreal mammal	Not inspected	Not inspected	Not inspected	Not found	Not found	Not found
Spring	714	504861	6697736	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic 1214
Spring	715	504841	6697721	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	
Spring	716	504839	6697725	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	In burnt area , persist
Spring	717	504838	6697728	Microbat large	Nil	Nil	Nil	Good	N/A	

Season	Box No.	Easting	Northing	Hollow type	Species present	Evidence of use	Pest species	Box condition	Maintenance	Comments
Spring	718	504816	6697782	Microbat small	Nil	Nil	Nil	Good	N/A	Slit
Spring	719	504816	6697789	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Small 20 opening
Spring	720	504823	6697773	Med arboreal mammal	Nil	Nil	Nil	Fair	Minor fire damage	Minor fire damage to opening, pic1227
Spring	721	504822	6697771	Microbat small	Nil	Feathertail glider nest	Nil	Fair	Minor fire damage	Minor fire damage to opening, slit
Spring	722	505744	6694640	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	Trunk growing around base plate, spiderwebs on outside
Spring	723	505744	6694644	Microbat small	Nil	Nil	Nil	Good	N/A	No sign of wear, entrance was 10mm see photo
Spring	724	505746	6694625	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	N/A	20mm opening
Spring	725	505749	6694625	Microbat small	Nil	Nil	Nil	Good	N/A	No sign of wear, hole 10mm drilled
Spring	726	505732	6694547	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	
Spring	727	505730	6694547	Microbat small	Nil	Nil	Nil	Good	N/A	One picture
Spring	728	505744	6694556	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	
Spring	729	505743	6694558	Microbat large	Nil	Nil	Nil	Good	N/A	No wear, hole 18mm
Spring	730	505764	6694424	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Photo
Spring	731	505764	6694420	Microbat large	Nil	Nil	Nil	Good	N/A	Cobwebs, two chambers inside
Spring	732	505764	6694354	Med arboreal mammal	Nil	Nil	Nil	Good	Removed epicormic growth	One photo
Spring	733	505762	6694356	Microbat small	Nil	Nil	Nil	Good	N/A	Base not large small 15mm hole slit
Spring	734	505740	6694678	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	Removed epicormic growth	Hole size 20mm, epicormic growth over hollows see hollow
Spring	735	505744	6694676	Microbat large	Nil	Nil	Arboreal ants	Good	Removed epicormic growth	
Spring	736	505739	6694705	Med arboreal mammal	Nil	Possible scats	Nil	Good	N/A	4 images,
Spring	737	505743	6694705	Microbat small	Nil	Nil	Nil	Good	N/A	Entrance covered in cobwebs, diameter 15mm
Spring	738	504830	6697448	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	N/A	Pic 1031
Spring	739	504828	6697449	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Photo on camera 1029 Lukes phone
Spring	740	504825	6697464	Med	Nil	Feathertail	Nil	Good	N/A	Pic 1025

Season	Box No.	Easting	Northing	Hollow type	Species present	Evidence of use	Pest species	Box condition	Maintenance	Comments
				arboreal mammal		glider nest				
Spring	741	504822	6697463	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt up see photo
Spring	742	504858	6697393	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Cavity 70mm deep, 250mm wide. Can see in due to being burnt out
Spring	743	504863	6697394	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	
Spring	744	504868	6697379	Med arboreal mammal	Nil	Microbat scat (possible)	Nil	Good	N/A	Pic 1042
Spring	745	504864	6697377	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Hole is the 20mm
Spring	746	504894	6697329	Med arboreal mammal	Nil	Antechinus nest (prob)	Nil	Good	N/A	Pic 1051, pic1053
Spring	747	504896	6697325	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	
Spring	748	504902	6697311	Small arboreal mammal	Nil	Old native beehive	Nil	Good	N/A	Pic 1100
Spring	749	504905	6697311	Microbat large	Nil	Old native beehive	Nil	Good	N/A	Entry bl+A1:P55ocked
Autumn	700	505647	6693785	Small arboreal mammal	Nil	Feathertail glider nest	Nil	Good	N/A	Chew markings around entrance hole
Autumn	701	505642	6693786	Microbat large	Nil	Nil	Arboreal ants	Good	N/A	
Autumn	702	505638	6693859	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	50Mm entry, pic228
Autumn	703	505636	6693859	Microbat small	Nil	Nil	Nil	Good	Removed epicormic growth	Entry is perpendicular
Autumn	704	505651	6693907	Small arboreal mammal	Nil	Nil	Nil	Good	Removed epicormic growth	
Autumn	705	505648	6693910	Microbat small	Nil	Nil	Nil	Poor	N/A	Plunge cut no front
Autumn	706	505621	6694013	Med arboreal mammal	Nil	Nil	Arboreal ants	Good	Removed epicormic growth	Pic 1455
Autumn	707	505637	6694019	Microbat small	Nil	Nil	Arboreal ants	Good	Ant nest reopened with drill	
Autumn	708	505621	6694011	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	
Autumn	709	505620	6694011	Microbat small	Nil	Nil	Nil	Poor	N/A	Plunge cut, closing over
Autumn	710	504877	6697639	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic 1253.
Autumn	710	504877	6697639	Microbat small	Not inspected	Not inspected	Not inspected			
Autumn	711	504934	6697707	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt out
Autumn	712	504880	6697631	Med	Nil	Antechinus	Arboreal ant	Good	N/A	Pic 1248

Season	Box No.	Easting	Northing	Hollow type	Species present	Evidence of use	Pest species	Box condition	Maintenance	Comments
				arboreal mammal		nest (prob)	material			
Autumn	713	504879	6697631	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt out
Autumn	714	504843	6697719	Med arboreal mammal	Not inspected	Not inspected	Not inspected	Not found	Not found	Not found
Autumn	714	504861	6697736	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic 1214
Autumn	715	504841	6697721	Small arboreal mammal	Nil	Feathertail glider nest (prob)	Nil	Good	N/A	Epicormic shoot removed
Autumn	716	504839	6697725	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	In burnt area , persist
Autumn	717	504838	6697728	Microbat large	Nil	Nil	Arboreal ants	Good	N/A	
Autumn	718	504816	6697782	Microbat small	Nil	Nil	Nil	Good	N/A	Slit
Autumn	719	504816	6697789	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Small 20 opening
Autumn	720	504823	6697773	Med arboreal mammal	Nil	Nil	Nil	Fair	Minor fire damage	Minor fire damage to opening, pic1227
Autumn	721	504822	6697771	Microbat small	Nil	Feathertail glider nest	Nil	Fair	Minor fire damage	Minor fire damage to opening, slit pic @ 1042
Autumn	722	505744	6694640	Med arboreal mammal	Squirrel glider (x1)	Nil	Nil	Good	N/A	Pics @ 1137 fled nest
Autumn	723	505744	6694644	Microbat small	Nil	Nil	Nil	Good	N/A	No sign of wear, entrance was 10mm slit see photo
Autumn	724	505746	6694625	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	N/A	20mm opening
Autumn	725	505749	6694625	Microbat small	Nil	Nil	Nil	Good	N/A	No sign of wear, hole 10mm drilled
Autumn	726	505732	6694547	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	
Autumn	727	505730	6694547	Microbat small	Nil	Nil	Nil	Good	N/A	15Mm slit
Autumn	728	505744	6694556	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	
Autumn	729	505743	6694558	Microbat large	Egernia spp. (prob)	Nil	Nil	Good	N/A	No wear, hole 18mm
Autumn	730	505764	6694424	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Photo
Autumn	731	505764	6694420	Microbat large	Nil	Nil	Nil	Good	N/A	Cobwebs, two chambers inside
Autumn	732	505764	6694354	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	One photo
Autumn	733	505762	6694356	Microbat small	Nil	Antechinus nest (prob)	Nil	Good	N/A	Base not large small 15mm hole slit

Season	Box No.	Easting	Northing	Hollow type	Species present	Evidence of use	Pest species	Box condition	Maintenance	Comments
Autumn	734	505740	6694678	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	N/A	Hole size 20mm, epicormic growth over hollows see hollow
Autumn	735	505744	6694676	Microbat large	Nil	Nil	Arboreal ants	Good	N/A	Took pic @ 1130
Autumn	736	505739	6694705	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	4 images,
Autumn	737	505743	6694705	Microbat small	Nil	Nil	Nil	Good	N/A	diameter 15mm slit need hole drilled to see
Autumn	738	504830	6697448	Small arboreal mammal	Nil	Nil	Arboreal ants	Good	N/A	Pic 1031
Autumn	739	504828	6697449	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Photo on camera 1029 Lukes phone
Autumn	740	504825	6697464	Med arboreal mammal	Nil	Feathertail glider nest	Nil	Good	N/A	Pic 1025
Autumn	741	504822	6697463	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Burnt up see photo
Autumn	742	504858	6697393	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	Cavity 70mm deep, 250mm wide. Can see in due to being burnt out
Autumn	743	504863	6697394	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	
Autumn	744	504868	6697379	Med arboreal mammal	Nil	Nil	Nil	Good	N/A	Pic 1042
Autumn	745	504864	6697377	Small arboreal mammal	Nil	Nil	Nil	Good	N/A	Hole is the 20mm
Autumn	746	504894	6697329	Med arboreal mammal	Nil	Antechinus nest (prob)	Nil	Good	N/A	Pic 1051, pic1053
Autumn	747	504896	6697325	Unknown	Not inspected	Not inspected	Not inspected	Poor	Burnt needs new hollow	
Autumn	748	504902	6697311	Small arboreal mammal	Nil	Old native beehive	Nil	Good	N/A	Pic 1100
Autumn	749	504905	6697311	Microbat large	Nil	Old native beehive	Nil	Good	N/A	Entry blocked

Appendix D – Microbat monitoring data 2020-21.

Table D1: Microbat bat box and drainage structure monitoring data year one operation monitoring (2020-21).

Section	Structure No.	Site Name	Easting	Northing	Roost features	Date	Species present	Number	Evidence	Breeding	Pest species	Box condition	Overall habitat value	Comment
1	46	Boneys Creek	512446	6686141	8 bat boxes; 2 cells (dimensions?); 41 joints suitable for roosting; 31 joints with roughened surface;	18/05/2021	Little bent-wing bat	250-300	Bats recorded in 13 joints, with scats recorded beneath a further 9 joints	Nil	Nil	Good	High - likely use by several hundred little bentwing bats in autumn & winter;	Bats predominantly using 25mm wide joints. Most joints with evidence only were <25mm. Boxes empty. Evidence of bats using the roughened surface
1	49	Nth Boneys	511986	6686377	2bat boxes, 10 joints with roughened ceiling & 8 joints suitable for roosting	18/05/2021	Nil	0	Small amount of large scat beneath both boxes.	Nil	Nil	Good	Most joints are of low-moderate value; boxes represent most suitable habitat at the site	Several joints are wet & likely unsuitable for roosting. Boxes empty
1	66	Grays Rd	510216	6687502	3cells (2.4h x 3w); all cells contain box sections within uneven joints	18/05/2021	Little bent-wing bat; Unid (poss eastern horseshoe bat in side pipe)	80-115 (50-75 in centre cell & 30-40 in nth cell)	Bats recorded in 3 joints and scat deposits recorded beneath an additional 9 joints	Nil	Nil	NA	High - likely use by several dozen bentwing bats; bats using lip between box sections; no joints appear suitable.	Unused joints suggest bats are changing roosts between days. Possible external roosting based on wear marks on ceiling.
1	67	Grays	510154	6687539	1 (1050mm) pipe	18/05/2021	Nil	0	Nil	Nil	Nil		Low	Pipe inspected

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		Road nth												from east side
2	25	H'way Ck culvert	506619	6690435	4 cells (3x 3.5wx3h & 1x3.5wx3.5; 8 hebel boxes; roughened ceiling in centre of 8 box sections in each cell	18/05/2021	Little bentwing bat	450-500 + 4 dead	Bats recorded in 28 joints across all cells, & 1 bat box; scats recorded beneath a further 19 joints & 3 lift points	Nil	Nil	Good	High - likely use by several hundred bentwing bats	Majority of unoccupied joints are in smaller size class 10-15mm. Evidence of bats using the roughened surface. Number of unoccupied roosts with evidence may be due to small number of bats and choice of roost sites.
2	25.1	H'way Ck bridge	506616	6690525	2 bat box	18/05/2021	Myotis macropus	SB=2; NB45-50	Large scat deposit beneath NB box	Nil	Nil	Good	High - sheltered location beside large creek	Difference in pelage colour - brown to dark (chocolate) brown
2	32	Glenugie Ck	504414	6698664	Single arch 9m diameter; 12 joints suitable for bats; 4 bat boxes (external)	18/05/2021	Little bent-wing bat	150-175	Bats recorded in 8 joints in old section	Nil	Nil	NA	High - known to be used by several hundred little bentwing	Boxes empty
2	40	Old highway	504252	6699472	2 cells; New H'way 1 cell (2.4Hx2.4W) contains 7 suitable joints all in west half; Old H'way 1 cell (2Wx1.5H); uneven box sections and areas of roughened concrete on ceiling	18/05/2021	Nil	0	Old H'way - small amount of scat & wear marks on parts of ceiling, obvert, and edges of box sections	Nil	Nil	NA	High - site likely to be used by several dozen bentwing bats during autumn and winter	Amount of scat influenced by rain events.
1	46	Boneys Creek	512446	6686141	8 bat boxes; 2 cells (dimensions?); 41 joints suitable for roosting; 31 joints with roughened surface;	12/11/2020	Large-footed myotis	2	Small amount of scat on boardwalk; wear recorded on 15 joints, including	Nil	Nil	Good	High - likely use by several hundred little bentwing bats in	Distribution of wear suggests that bats are using the roughened ceiling to roost.

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									roughened ceiling				autumn & winter;	
1	49	Nth Boney's	511986	6686377	2bat boxes, 10 joints with roughened ceiling & 8 joints suitable for roosting	10/11/2020	Nil	0	Very small amount of scat in boxes	Nil	Nil	Good	Most joints are of low-moderate value; boxes represent most suitable habitat at the site	
1	66	Grays Rd	510216	6687502	3cells (2.4h x 3w); all cells contain box sections within uneven joints	10/11/2020	Nil	0	Scat deposits beneath 8 joints in nth cell, 5 joints in central cell & 4 joints in Sth cell	Nil	Nil	NA	High - likely use by several dozen bentwing bats; bats using lip between box sections; no joints appear suitable.	
1	67	Grays Road nth	510154	6687539	1 (1050mm) pipe	10/11/2020	Nil	0	Nil	Nil	Nil		Low	Pipe inspected from east side
2	25	H'way Ck culvert	506619	6690435	4 cells (3x 3.5wx3h & 1x3.5wx3.5; 8 hebel boxes; roughened ceiling in centre of 8 box sections in each cell	10/11/2020	Little bentwing bat	1 alive & 1 dead	Small-large scat deposits beneath 11 joints in Sth cell, 12 joints of mid-Sth, 10 joints of mid-nth, 16 joints of nth cell, & all bat boxes	Nil	Nil	Good	High - likely use by several hundred bentwing bats	Likely that some external roosting occurs as several joints with scats are too narrow for access, also using lifting anchors. Amount of scat influenced by flushing of culvert. Scat load increases from Sth to nth.
2	25.1	H'way Ck bridge	506616	6690525	1 bat box	10/11/2020	Myotis macropus	SB=2; NB45-55	Large scat deposit beneath NB box	Nil	Nil	Good	High - sheltered location beside large creek	Difference in pelage colour - brown to dark (chocolate) brown

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2	32	Glenugie Ck	504414	6698664	Single arch 9m diameter; 12 joints suitable for bats	25/11/2020	Nil		Nil	Nil	Nil	NA	High - known to be used by several hundred little bentwing	Exclusion removed on 25/11/20. Exclusion has been in place for 14 months
2	40	Old highway	504252	6699472	2 cells; New H'way 1 cell (2.4Hx2.4W) contains 7 suitable joints all in west half; Old H'way 1 cell (2Wx1.5H); uneven box sections and areas of roughened concrete on ceiling	12/11/2020	Nil	0	Old H'way - small amount of scat & wear marks on parts of ceiling, obvert, and edges of box sections	Nil	Nil	NA	High - site likely to be used by several dozen bentwing bats during autumn and winter	Amount of scat influenced by rain events.