Woolgoolga to Ballina Pacific Highway upgrade

Threatened Gliders Monitoring Program

Operation Phase (Sections 1-2)
Construction Phase (Sections 3-11)

Annual Report 2018

Version 2.0 (*FINAL Report*)

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Woolgoolga to Ballina Pacific Highway Upgrade

Threatened Gliders Monitoring Program 2018 (Year 2)

Operation Phase (Sections 1-2)

Construction Phase (Sections 3-11)

Annual Report

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Cover Photo: Squirrel glider (Petaurus norfolcensis) during mid-glide phase (Photograph: Sandpiper Ecological).

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1. Introduction

1.1 Background

The Woolgoolga to Ballina (W2B) Pacific Highway Upgrade received State approval under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act) on 24 June 2014 and Federal approval under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) on 14 August 2014. The Threatened Glider Management Plan (TGMP) (Roads and Maritime Services, version 3.0, February 2018) was developed to meet the requirements of State Ministerial Condition of Approval (MCoA) D8 and components of MCoA D2. None of the glider species addressed in the plan are listed under the EPBC Act.

The TGMP identifies potential impacts of the upgrade on two threatened glider species - squirrel glider (Petaurus norfolcensis) and yellow-bellied glider (P. australis) - collectively referred to as 'threatened gliders'. Both species are listed as vulnerable by the NSW Biodiversity Conservation Act 2016 (BC Act) and inhabit open forests and woodlands throughout the ranges and coastal areas of north-east NSW although the yellow-bellied glider is largely absent from highly fragmented alluvial floodplains and coastal heathlands (RMS 2018). Numerous records of both species occur within 10km of the project alignment (Roads and Maritime Services 2015).

The TGMP proposes several mitigation measures aimed at ensuring the continued viability of squirrel glider (SqG) and yellow-bellied glider (YbG) populations in the project area. Such measures aim to:

- Minimise fragmentation and loss of habitat;
- Provide functional crossing opportunities (including crossing structures);
- Maintain connectivity for daily movements and gene flow;
- Minimise edge effects.

To assess the effectiveness of the proposed mitigation measures, the TGMP details a comprehensive monitoring program. The components of the monitoring program include:

1. Glider population monitoring.
2. Arboreal crossing structures and widened medians monitoring.
3. Road mortality monitoring.
4. Nest box monitoring.
5. Habitat revegetation monitoring.

These five components fall under the broad goals of the monitoring program which are:

1. To provide an adaptive monitoring program to assess the effectiveness of the mitigation measures proposed and allow corrective measures to be implemented. To develop contingency measures that would be implemented in the event of changes to habitat usage patterns or evidence that mitigation measures are ineffective and directly attributable to the construction or operation of the road; and,
2. To provide annual reporting of monitoring results.

The following report addresses components 1 – 3 of the monitoring program. Components 4 and 5 (Nest box monitoring and Habitat revegetation monitoring) are not part of the scope of this report. Earlier phases of components 1 - 3 of the monitoring program have been reported on previously (refer Sandpiper Ecological 2014, 2016, 2018a)

1.1.1 Glider population monitoring

The TGMP states that the objective of glider population monitoring is:

> "To establish if there is a difference in occupational abundance of threatened gliders or activity levels before, during and after the project."

To achieve this objective, the TGMP directs that population monitoring will occur at:

- Impact sites: mitigated sites such as widened medians and crossing structures within 100m of the road edge.
- Control sites: unmitigated sites within 100m of the road edge.
- Reference sites: sites >300m from the project.

The TGMP details that glider population monitoring will occur before (i.e. pre-disturbance), during (i.e. during disturbance) and after (i.e. post-disturbance/operation phase when mitigation in place) construction and that the occupation levels (i.e. presence/absence) will be compared between these periods for impact, control and reference sites.

To determine the effectiveness of mitigation measures, Table 8.1 of the TGMP describes performance indicators and corrective actions for threatened glider population monitoring. A single performance indicator is stated for the threatened glider population monitoring:

1. Decline in the after-construction occupancy rates of squirrel glider or yellow-bellied glider at impact sites over three consecutive monitoring sessions.

In the event of a decline in post-construction occupational abundance, the following corrective actions are described:

a. Review monitoring methods, considering further monitoring and assessment should there be a decline in population abundance.
b. Consider potential for natural variation to be responsible for decline in population numbers /density.
c. Review location of arboreal crossing structures and consider adding new structures.
d. Investigate habitat adjoining the highway and consider improving habitat condition and connectivity.
e. Post three years of monitoring and implementation of corrective actions, if connectivity measures cannot be demonstrated to be effective at successfully mitigating the barrier and fragmentation impact to glider species, the residual impact to connectivity shall be offset. This is in accordance with MCoA D2.

1.1.2 Arboreal crossing structures and widened medians monitoring

The TGMP states that the objective of arboreal crossing structures and widened medians monitoring is:

> "To establish the level of use of various crossing structures (i.e. glide poles, widened medians and rope bridges) by squirrel glider and yellow-bellied glider."

Monitoring locations include connectivity structures targeted for threatened gliders listed in Table 8.4 and include rope crossings, land bridges and widened medians. As different sections of the W2B upgrade are being constructed independently, crossing structure deployment will occur at different times during the construction phase. The intention is to schedule monitoring of all arboreal crossing structures within a project section at the same time, rather than individually (RMS 2018). This will enable meaningful and robust data comparisons and reduce the potentially confounding effects of differing stages of construction.

To determine the effectiveness of crossing structures and widened medians, Table 8.2 of the TGMP outlines performance indicators and corrective actions. A single Performance Indicator is stated for crossing structures and widened medians monitoring:

1. No evidence of use of arboreal crossing structures and widened medians by threatened gliders post-construction.

In the event of no evidence of use, the following Corrective Actions are described:

a. Review location and type of connectivity structures installed and implement provisional measures in consultation with EPA which may include but not limited to the installation of more glide poles or rope bridges, particularly where known mortality hotspots occur.
b. Consider more strategic planting of habitat or the installation of additional glide poles, informed by the long-term population monitoring data.
c. Post three years of monitoring and implementation of corrective actions, if connectivity measures cannot be demonstrated to be effective at successfully mitigating the barrier and fragmentation impact to glider species, the residual impact to connectivity shall be offset. This is in accordance with MCoA D2.

1.1.3 Road mortality monitoring

Monitoring of threatened glider mortalities on the road will occur adjacent to all arboreal crossing structures and the widened medians in relevant project sections and also at established control sites (RMS 2018). The correlation between connectivity structures and glider road mortalities will be measured by the monitoring program and a higher or non-significant difference in mortality between impact and control sites may indicate that the mitigation measure is ineffective for road mortality prevention or reduction.

The stated objective of road mortality monitoring is:

> "Record the incidence of glider-vehicle collisions at mitigated (impact) and unmitigated (control) sites, to establish if there is a positive effect (i.e. decrease in glider mortality) associated with crossing structures. This is to meet MCoA D8(g)."

To determine the effectiveness of connectivity structures in preventing or reducing glider road mortality, Table 8.3 of the TGMP outlines Performance Indicators (1 & 2) and their respective Corrective Actions (a, b, ... etc.). They are as follows:

1. Higher mortality rate at impact sites or no significant difference in mortality rates for threatened gliders between impact and control sites.

    a. Review reported usage level of crossing structure by threatened gliders.
    b. Corrective actions may include but not limited to the installation of more glide poles or rope bridges to known mortality hotspots.
    c. Crossing structures also serve as 'insurance' in the case of stochastic events such as fire or disease which may occur at long time intervals. Further the cost of decommissioning and relocating a rope bridge or glide pole array is likely to be comparable to the cost of installing a new structure. Therefore, existing glide poles/rope bridges will be retained.
    d. Should road kill data indicate a road-kill hot-spot for gliders where there is limited crossing structures RMS will investigate the feasibility of installing additional crossing structures
    e. Post three years of monitoring and implementation of corrective actions, if connectivity measures cannot be demonstrated to be effective at successfully mitigating the barrier and

fragmentation impact to glider species, the residual impact to connectivity shall be offset. This is in accordance with MCoA D2.

2. High number of incidental records of threatened glider mortality away from crossing structures.

    a. Identify a hot spot.
    b. Review options for mitigation, i.e. crossing structure, signage, lowering speed limit.
    c. Consider implementation of crossing structure at identified hot-spot or other methods to reduce mortality (e.g. signage, review design of structure in that locality, additional plantings to encourage gliders away from road and to crossing structure).

1.2 Scope

Sandpiper Ecological was engaged by Jacobs in January 2017 to undertake the W2B threatened glider monitoring program. The current annual report refers to year 2 monitoring activities undertaken during Q1-4 of the 2018 calendar year in sections 1-2 (operation phase) and sections 3-11 (construction phase). These activities build upon year 1 monitoring completed during 2017 (refer Sandpiper 2018) and earlier baseline monitoring (refer Sandpiper 2015, 2016a, 2016b). Because performance indicators apply to operation phase activities, they are only discussed in relation to data for section 1-2.

2. Methods

2.1 Study area

The study area focal sections include sections 1-2 and sections 3, 6 and 7 (referred to as sections 3-11) of the W2B Pacific Highway upgrade, between Woolgoolga and Tabbimoble and habitat within 1km of the project alignment (impact and control sites) and habitat surrounding reference sites up to 4km from the project alignment (Figures 1-6). Focal areas were largely dry sclerophyll forest and small areas of swamp sclerophyll forest. The study area is located within the north coast bioregion and experiences a largely sub-tropical climate (NSW NPWS 2003).

The five focal sections of the W2B alignment featured 76 monitoring sites - 31 impact, 26 control and 19 reference sites (Table 1). Impact sites were at locations of proposed crossing structures and vegetated medians. These have only been installed/completed in sections 1-2. Control sites were positioned in forest habitat largely equivalent to impact sites and a minimum 500m but mostly >1000m from impact sites. Reference sites were in equivalent forest habitat >1000m from either impact or control sites.

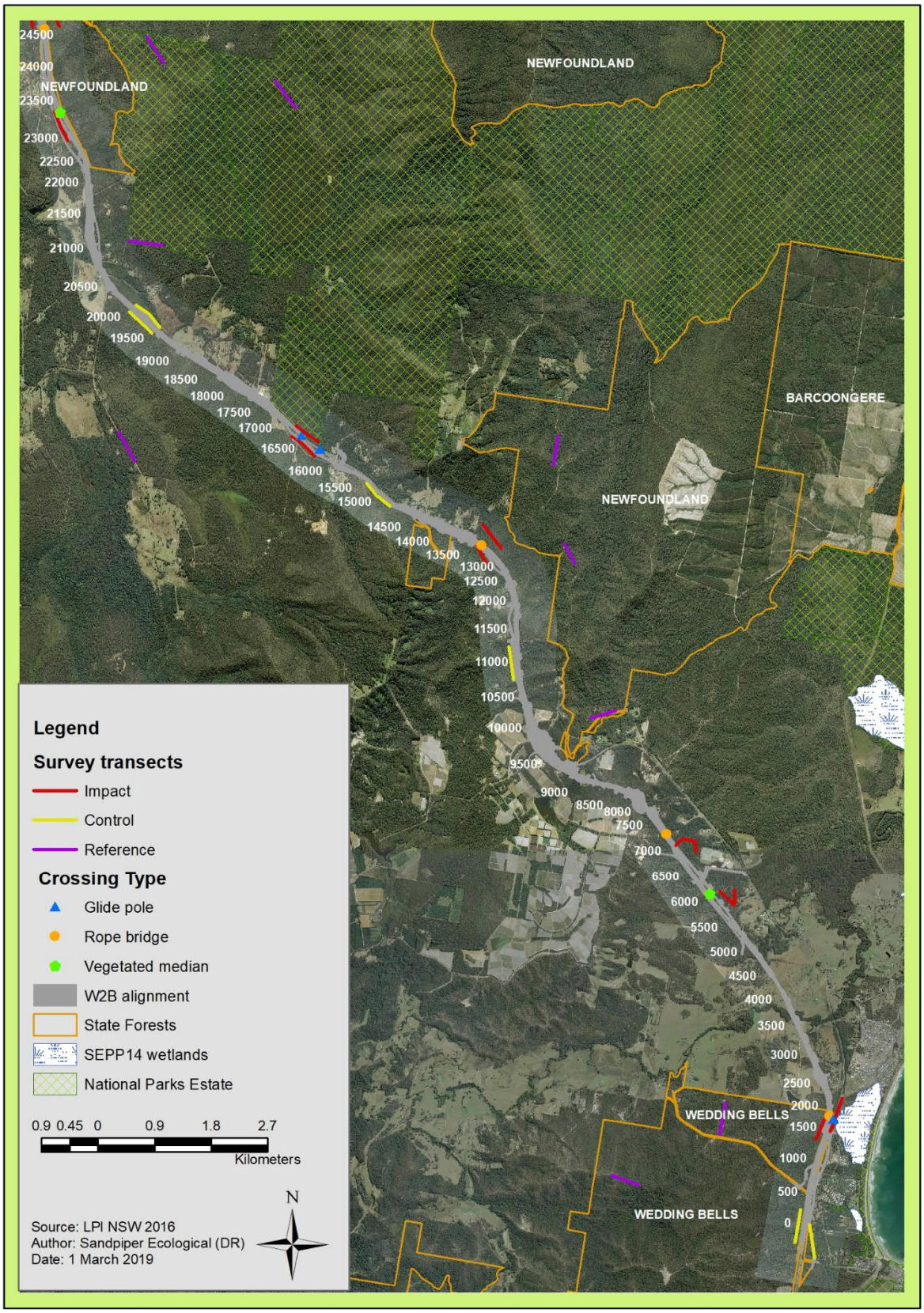

Figure 1: Threatened glider impact, control and reference sites across the W2B alignment.

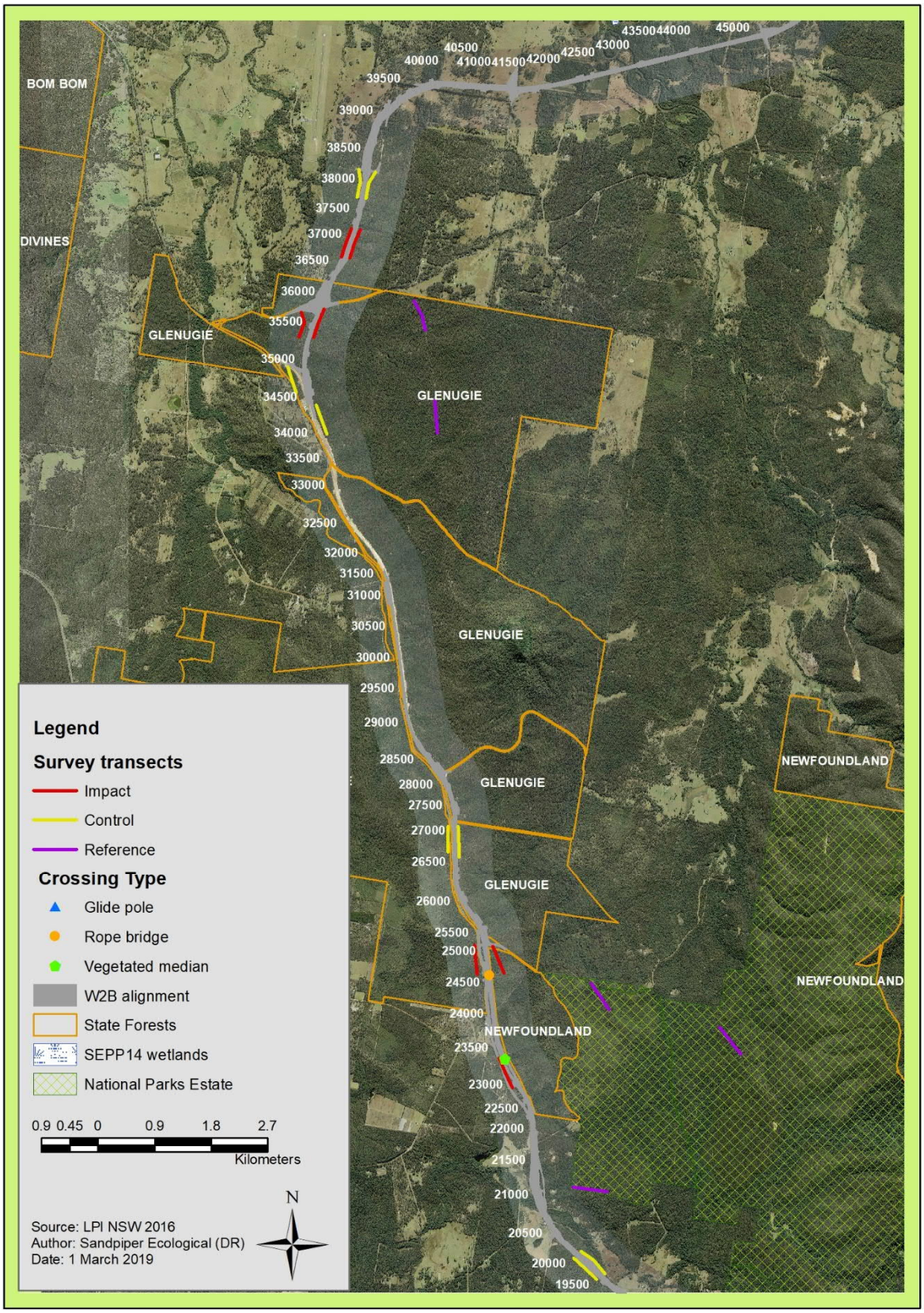

Figure 2: Threatened glider impact, control and reference sites across the W2B alignment.

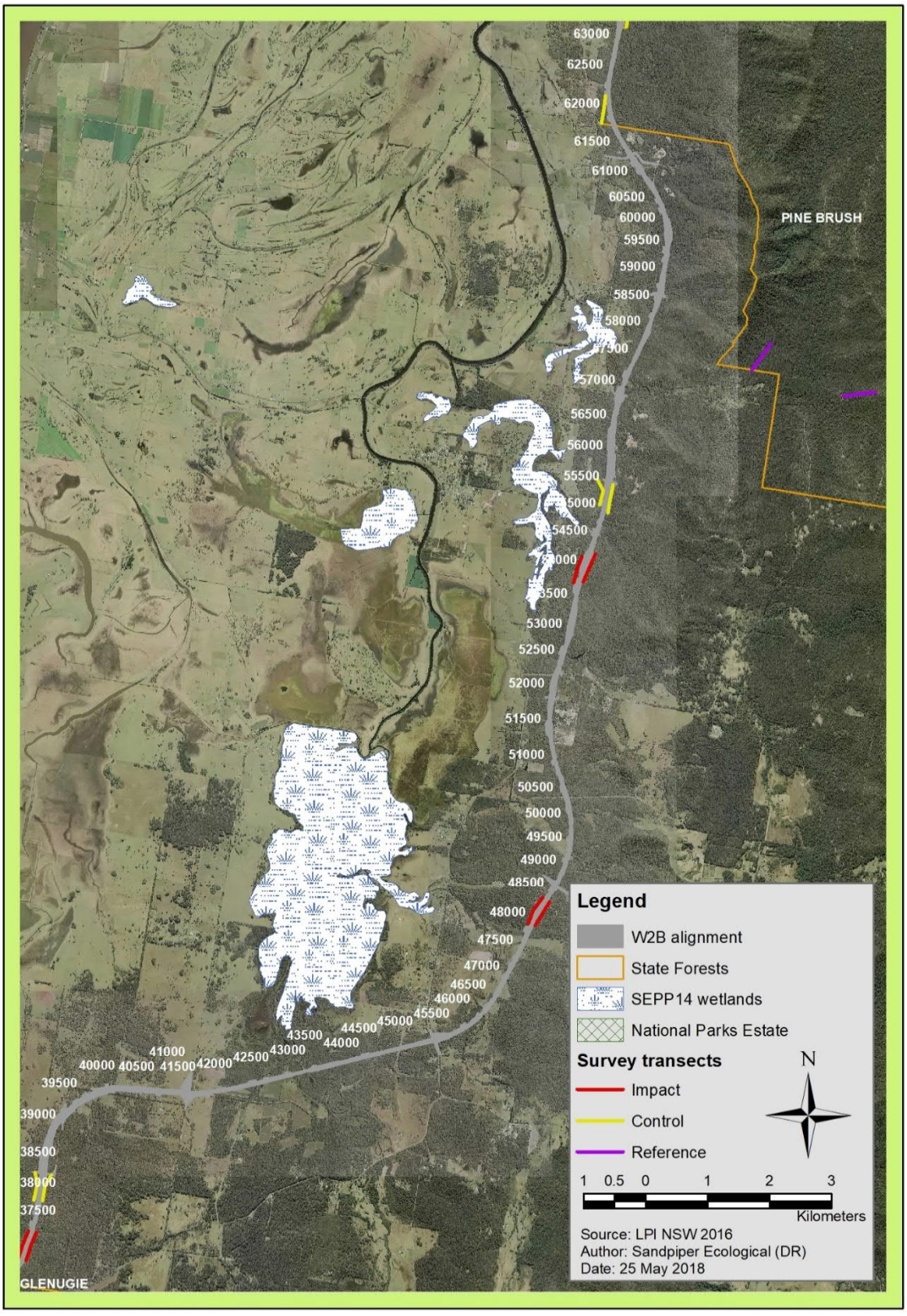

Figure 3: Threatened glider impact, control and reference sites across the W2B alignment.

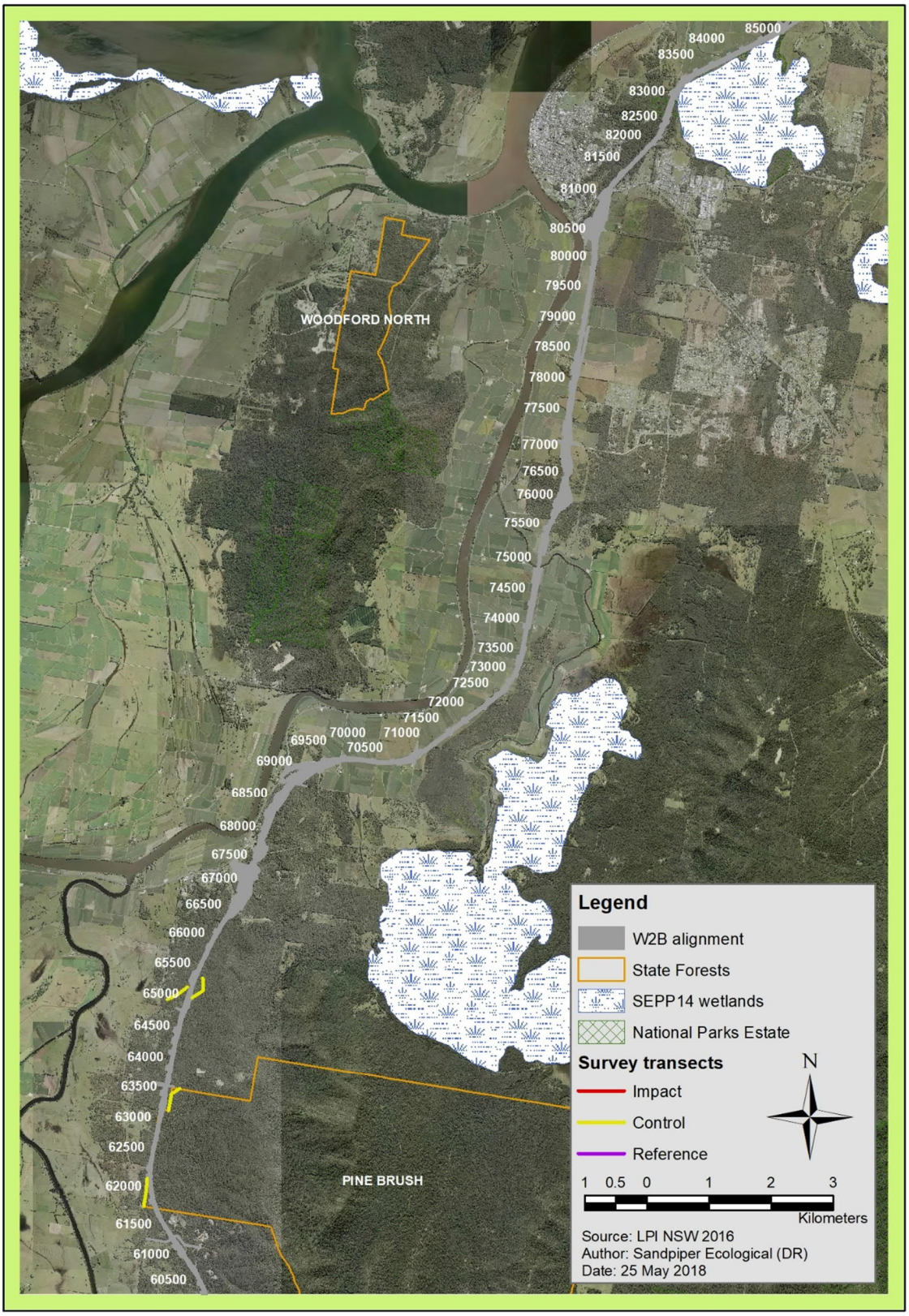

Figure 4: Threatened glider impact, control and reference sites across the W2B alignment.

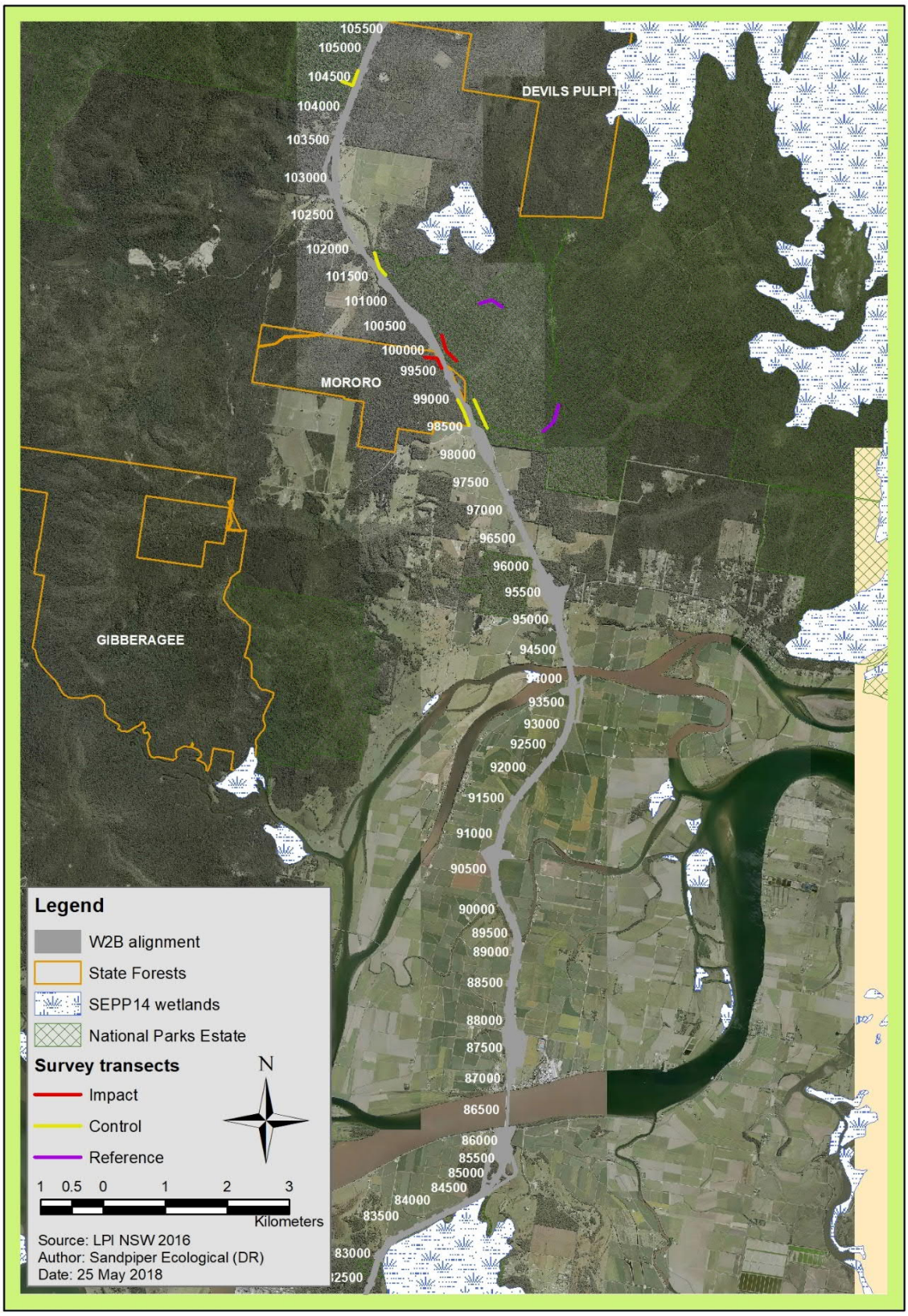

Figure 5: Threatened glider impact, control and reference sites across the W2B alignment.

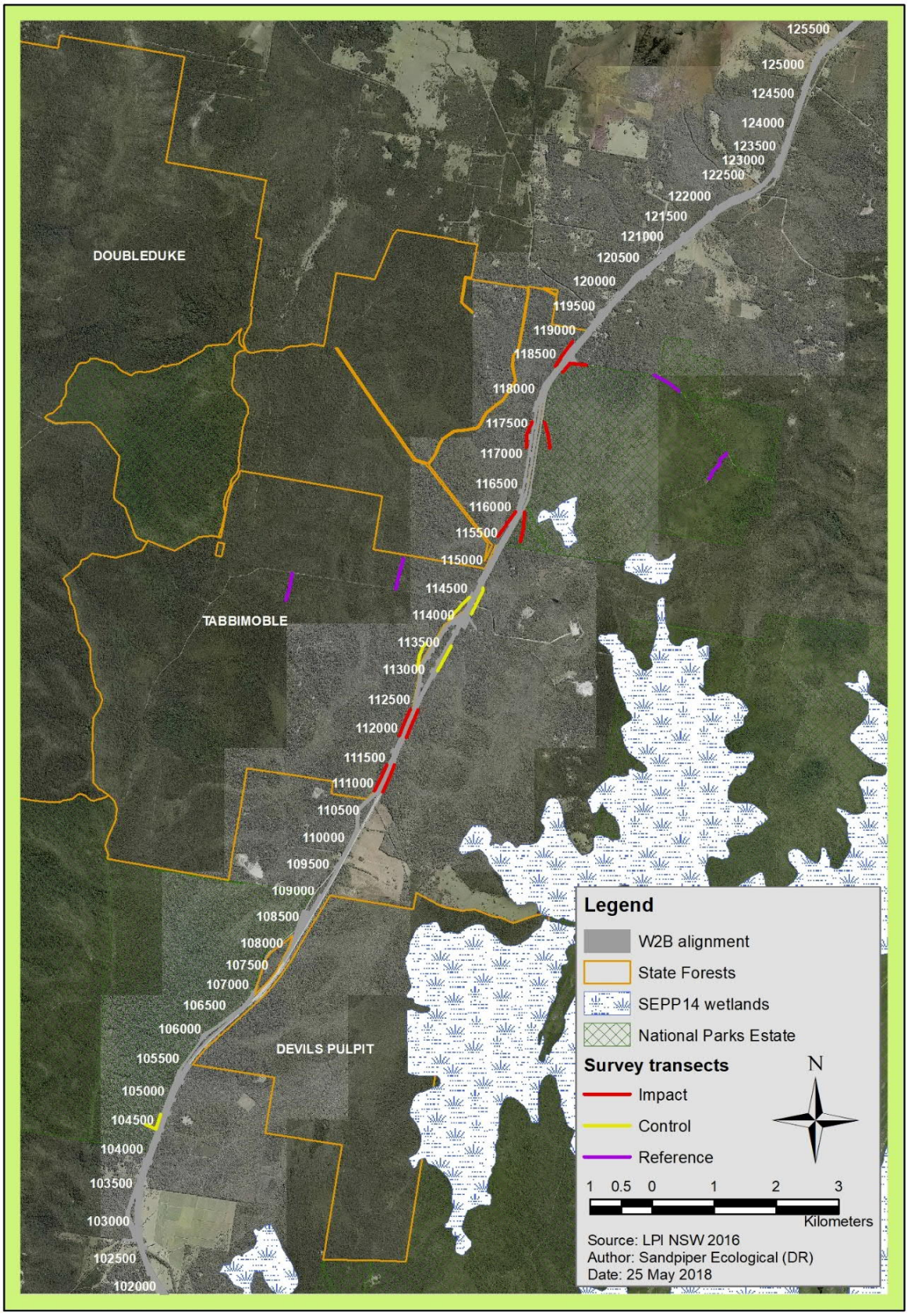

Figure 6: Threatened glider impact, control and reference sites across the W2B alignment.

Table 1: Location of impact, control and reference sites positioned in sections 1-2 and 3-11 of the W2B Upgrade. RB = rope bridge; GP = glide pole; VM = vegetated median.

Section	Site Name	Transect ID	Approximate chainage at centre of transect		
			Impact	Control	Reference
1	C1 (RB1 & GP1)	C1-east/north	1900	100	1500
		C1-west/south	1900	100	500
1	M1 (VM1)	M1	6000	-	-
1	S2 (RB2)	S2	7300	-	-
1	M1/S2	M1/S2	-	11200	9000
1	C2 (RB3)	C2-east/north	13100	-	13200
		C2-west/south	13100	15000	13200
2	C3 (GP2 & GP3)	C3-east	16000	19600	20900
		C3-west	16000	19600	20300
2	M2 (VM2)	M2	23200	-	-
2	S3 (RB4)	S3-east	25000	27000	25200
		S3-west	25000	27000	25200
3	Glenugie South	GS-east	35700	34050	-
		GS-west	35700	34750	-
3	Glenugie North	GN-east	37050	38000	-
		GN-west	37050	38000	-
3	Glenugie Reference	G-r-north	-	-	35800
		G-r-south	-	-	33950
3	Tucabia South	TucS-east	48250	55250	-
		TucS-west	48250	55350	-
3	Tucabia Mid	TucM-east	-	63500	-
		TucM-west	-	61850	-
3	Tucabia North	TucN-east	54050	65300	-
		TucN-west	54050	65100	-
3	Tucabia Reference	Tuc-r-north	-	-	57900
		Tuc-r-south	-	-	57200
6	Mororo	Mor-east/north	99600	98500	100100
		Mor-west/south	99600	98600	98100
6 & 7	Tabbimoble South	TabS-east	111350	101400	-
		TabS-west	111350	104550	-
7	Tabbimoble Mid	TabM-east	112350	113550	-
		TabM-west	112350	113550	-
7	Tabbimoble North	TabN-east	115950	114550	-
		TabN-west	115950	114550	-
7	Tabbimoble Veg Median	TabVM-east	117400	-	-
		TabVM-west	117400	-	-
7	Tabbimoble Land Bridge	TabLB-east	118850	-	-
		TabLB-west	118850	-	-
7	Tabbimoble Nature Reserve Reference	TabNR-r-nth	-	-	118700
		TabNR-r-sth	-	-	117300
7	Tabbimoble Double Duke State Forest Reference	TabDD-r-north	-	-	114750
		TabDD-r-south	-	-	114300
Total Transects			31	26	19

2.2 Glider population monitoring

Glider population surveys were conducted at monitoring sites established during baseline surveys (Sandpiper 2015, 2016a; Table 1). Each site featured a 500m-long transect mostly positioned on existing tracks or management trails. Impact and control transects' were parallel to and within 100m of the highway alignment whereas reference transects were >1km from the highway alignment. Transects were located within dry open forest habitat or a combination of dry open forest and moist open forest or swamp forest.

Spotlight and call playback surveys were conducted at each site in each of four quarters during 2018. Q2 and Q4 survey periods were extended due to delays caused by poor weather conditions. Survey periods were from 12/2 – 2/3/2018 (Q1), 12/6 – 16/7/2018 (Q2), 2-13/9/2018 (Q3) and 10/12/2018 – 31/1/2019 (Q4). Each transect was surveyed on two non-consecutive nights during each survey period. Two to four experienced ecologists conducted the surveys concurrently on nearby transects (i.e. one observer/transect) and the order and allocation of transects was changed each survey to avoid bias. Impact transects M1-I (Q1-4) and GSie and GSiw (Q1) and reference transects TabDDrn and TabDDrs (Q3 & Q4) were not surveyed because of access restrictions. Due to a 50-100m westward realignment of the final highway design in the vicinity of ch.35000-36000, impact transect GSiw was moved approximately 80m west and former transect GSiw became transect GSie.

Spotlight surveys were of 30 minutes' duration and preceded by YbG call playback. Playback included a five-minute listening period, five minutes of playback followed by spotlighting with a hand-held 200+ lumen torch. Surveys began at least 45-60 minutes after sunset and were mostly completed within six hours after sunset. Surveys were conducted between third quarter and first quarter moon phases to avoid the period around the full moon. Weather conditions were generally fine during surveys with occasions of moderate winds and/or light showers. Full details of survey weather conditions and effort are provided in Tables A1-4, Appendix A.

On occasions during surveys when an individual could not be confidently distinguished between a squirrel glider (SqG) and a sugar glider (P. breviceps), it was recorded as squirrel/sugar. To determine the likelihood of each of these records being a squirrel glider, all survey data for all periods (including pre-construction) for each of these transects was reviewed. If squirrel gliders only were detected on that transect on other occasions or on more occasions than sugar gliders, the record was scored as 'probable' squirrel glider and included as a 'presence' record. If squirrel gliders were not detected on that transect on other occasion(s) or if sugar gliders were previously detected on more occasions the record was scored as 'probable' sugar glider.

2.3 Arboreal crossing structures and widened medians monitoring

Four rope bridges, three glide poles and two vegetated medians were installed or created (in the case of vegetated medians) within sections 1-2 between early 2016 and late 2017 (Figure 1 & 2). Each of their design features and monitoring methods are described below.

2.3.1 Rope bridges

The four rope bridges were ladder mesh design and featured 400mm-wide mesh made from 10mm diameter silver rope woven into a 100mm wide grid pattern. The mesh included two 20mm-thick ropes running through the length (Plate 1). Rope bridges were slung between 3mm wire rope and supported by 10mm wire rope. Bridges spanned 64m (RB2) to 72m (RB1) and were fixed to the top of poles by bulkheads which were 9.6m (RB3 east – on top of cutting) to 18.2m (RB1 west) above ground level (Table 2). Bridge ends/bulkheads were at the height of mid-upper canopy of adjoining forest and 2-8m from the closest tree canopy. Lengths of 25mm diameter silver rope extended from the bulkhead to adjacent trees (Plate 1).

Table 2: Rope bridge dimensions and site features.

Rope bridge no.	Chainage (section)	Length of bridge (m)	Height of bulkhead east / west (m)	Distance to tree canopy east/west (m)
RB1	1800 (1)	72	14 / 18.2	2 / 3
RB2	7100 (1)	64	15 / 15.5	6 / 2
RB3	13040 (1)	69	9.6 / 16.8	3 / 4
RB4	24800 (2)	69	15 / 14.8	8 / 2

Plate 1: Rope bridges were suspended >10m above the road deck (upper) and supported by poles adjacent to the forest edge. The mesh ladder design included two 20mm thick ropes running the length (lower left). A camera was strapped to the bulkhead at each end of the bridge (lower right).

Rope bridge monitoring entailed camera surveillance of the rope bridge surface to determine use by arboreal fauna. Cameras were installed by a tree climber on 18/6/2018 and operated continuously through Q3 and Q4. Cameras were checked on 20/9/2018 and 5/12/2018 to refresh batteries and change SD cards. Cameras were strapped to the bulkhead at each end of the four rope bridges and faced out along the length of the ladder mesh (Plate 1). Camera types used included Swift 3C, Moultrie S-Series, Spromise S108 and Browning Strike

Force. Cameras were scheduled to turn on at 1700 hours and turn off at 0600 hours eastern standard time (EST) except for Moultrie and Browning cameras which do not feature a scheduling function. Cameras were set at low-medium sensitivity and programmed to take 10 seconds of video upon triggering with no delay between triggers. A variety of camera models were used as a trial to determine which model would be most suitable for ongoing monitoring.

Either camera at each of the four rope bridges was active for between 78 (RB4) and 170 days (RB3) during Q3 and Q4 monitoring. This represented between 46% and 100% of the 170-day period (Table 3). False-triggers caused by passing vehicles was the major source of excess photos and battery fatigue. To manage this, camera sensitivity was reduced on most cameras and a 1200mm-long, black core-flute sheet was attached on the underside of each end of all four rope bridges during Q4. This will be reported on in the 2019 annual report.

Table 3: Camera activity periods during Q3 and Q4 rope bridge monitoring. The monitoring period extended for 170 days.

Rope bridge no.	No. of videos	No. of days either camera active	% of period either camera active
RB1	2647	107	63
RB2	4558	95	56
RB3	4554	170	100
RB4	4203	78	46

2.3.2 Glide poles

Glide poles were positioned within the median at Halfway Creek (GP2 & GP3) and along the southbound road shoulder of the Solitary Islands Way/old Pacific Hwy (GP1). Poles were CCA-treated hardwood timber and stood 17.4m (GP1) to 20.0m (GP2 & GP3) above road level (Table 4; Plate 2). Poles were approximately 450mm diameter at breast height and tapered to approximately 330mm near the pole top. A 500mm diameter metal predator shield was attached above the top of the GP3 pole (Plate 3). Each pole featured two cross arms for gliders to launch from. Each arm was approximately 2400mm long and 150 x 100mm thick hardwood and brace-mounted to the pole at its center (Plate 3). Arms were oriented perpendicular and parallel to the highway and the upper arm was attached approximately 300mm below the top of the pole. For GP2 and GP3, the upper arm was parallel to the highway and fixed approximately 70mm above the lower/perpendicular arm. The arm positions were the opposite for GP1.

Glide distances from poles to the closest roadside tree trunks greater than 200mm DBH (i.e. viable glide landing trees for SqG and YbG) ranged between 20m and 25m for highway median poles GP2 and GP3 (Table 4). GP1 was 10m from roadside trees to the east and 37m from the closest roadside tree to the west. GP1 was also located 48m from the east end of RB1 and intended to provide a link, in conjunction with remnant canopy trees, for gliders moving to or from the rope bridge.

Table 4: Glide pole site features.

Glide pole no.	Chainage (section)	Position on road corridor	Height of upper cross arm (m)	Distance EAST to closest tree >200mm DBH (m)	Distance WEST to closest tree >200mm DBH (m)
GP1	1800 (1)	Edge of Solitary Islands Way	17.1	10	37
GP2	16060 (1)	median	19.7	25	20
GP3	16430 (1)	median	19.7	25	23

Plate 2: Glide poles stood 17.4m to 20m above road level and featured perpendicular and parallel-to-road cross arms. GP1 (left) was positioned adjacent roadside forest habitat on the eastern edge of the Solitary Island Way, approximately 50m from the rope bridge at chainage 1800 (RB1). GP2 (mid) and GP3 (right) were positioned within the highway median at Halfway Creek area (chainage 16060 & 16430).

Plate 3: GP3 featured a predator shield above the pole top (left). Cameras were mounted on a flat metal bar and projected ~150mm beyond the end of the parallel glide arm to capture glider activity (mid & right).

Glide pole monitoring entailed camera surveillance of the parallel arm of each pole to determine use by arboreal fauna. The parallel arm was selected based on monitoring results on the Sapphire to Woolgoolga upgrade (Sandpiper Ecological 2018). Cameras were installed by a tree climber on 18 and 19/6/2018 and operated continuously through Q3 and Q4. Installation involved attaching a Swift Enduro camera to a flat 600-900mm long metal bar which was then mounted on the northern end of the parallel arm of each glide pole such that each camera was positioned 100-200mm beyond the end of the glide pole arm (Plate 2). Cameras were scheduled to turn on at 1700 hrs and turn off at 0600hrs EST. Cameras were set on medium sensitivity and programmed to take 10 seconds of video footage upon triggering with no delay between triggers. Cameras were checked on 20/9/2018 (GP1 only) and 5/12/2018 to refresh batteries and change SD cards. All three glide pole cameras were active for the entire Q3 and Q4 monitoring period of 170/171 days (Table 5).

Table 5: Camera activity periods during Q3 & Q4 glide pole monitoring. The monitoring period extended for 170/171 days.

Glide pole no.	No. of videos	No. of days camera active	% of period camera active
GP1	285	170	100
GP2	84	171	100
GP3	177	171	100

2.3.3 Vegetated medians

Vegetated medians extended for 1150m (VM1: chainage 5350-6500) and 550m (VM2: chainage 22900-23450) and passed through dry sclerophyll open forest (Figure 7). Carriageway corridor widths ranged between 30-60m and roadside tree heights were approximately 15-25m. Both sites featured a parallel-running service road 15-70m west of the northbound carriageway (i.e. McLaughlins Road at VM1 & old Pacific Highway at VM2).

During Q3 monitoring, hair funnels were installed within each vegetated median and in habitat immediately to the east and west of each median (Figure 7). Ten funnels were installed in an approximate line and spaced along the length of each median and each adjoining habitat. Funnels were installed via a ladder at 5-6m above ground level. Funnels were baited with a mixture of peanut butter, honey and oats and a dilute mixture of honey water was sprayed up the tree trunk to act as an attractant. Hair funnels were retrieved at the end of each sampling period and sent to a recognised hair identification analyst (Robyn Carter). Hair funnels were deployed for 14 nights (11-24/9/2918) during Q3 and 36 nights (5/12/2018 – 10/1/2019) during Q4. Because the hair of squirrel glider and sugar glider (Petaurus breviceps) cannot be reliably differentiated, hair samples attributed to either species is reported as SqG/SuG.

Figure 7: Aerial image of vegetated median sites VM1 (left) and incomplete VM2 (right). Blue lines represent hair funnel transects. Source: Google Earth.

2.4 Road mortality monitoring

Road mortality surveys were conducted during Q3 and to Q4 to coincide with crossing structure monitoring. Surveys entailed slowly walking a 500m-long transect either side of each crossing structure and vegetated median and the four population monitoring control sites in section 1-2. Walking transects were performed

from behind the guard rail by one to two ecologists. Surveys included scanning the road surface and road shoulder for animal carcasses. The exact location of each carcass was recorded on a data sheet and referred to in subsequent surveys to avoid double-counting. Surveys were completed on 20-21/8/2018 during Q3 and 5-6/12/2018 during Q4.

2.5 Data summary and analysis

2.5.1 Population survey data

Due to the different stages of completion, population monitoring data for sections 1-2 and section 3-11 were analysed separately. For each survey period, data for the two samples were pooled to determine presence/absence of YbG and SqG for each transect. Current survey data were then added to previous survey data and tabulated according to construction phase and treatment type (i.e. impact, control, reference). In total, all focal sections were surveyed in four periods during pre-construction, seven periods during construction and sections 1-2 were surveyed in four periods during operation phase.

In order to determine the association between pre-construction and operation phase occupation rate of YbG and SqG in sections 1-2, a Fisher's Exact Test was performed. The test examines the relationship between proportions (i.e. presence/absence) of categorical variables (i.e. pre-construction and post-construction) and is appropriate for small sample sizes (McDonald 2014). The null hypothesis was that the proportions of the two classifications do not differ. An assumption of the test is that all observations are independent although this may not be the case for all paired impact and control transects due to their proximity and data have a repeated sampling component. Data analyses were performed on SYSTAT 13.1 (Systat Software Inc.).

2.5.2 Rope bridge and glide pole camera data

Rope bridge and glide pole camera images were uploaded to a desk top computer and viewed using Windows Photo Viewer. Data recorded included: site, date, time, species, number of images and image numbers. Senior staff reviewed all images, with reference to standard field guides (i.e. Menkhorst & Knight 2003; Pizzey & Knight 2007). A hierarchical approach was adopted for species identification which included: species, genus or group. Identification accuracy was scored as either definite (90%+ certainty), probable (75-90% certainty) or possible (60-75% certainty).

For rope bridge pictures/footage of an animal, the road crossing likelihood was also scored according to the following criteria:

- Complete crossing - animal moves past camera in either direction and does not return within 10 minutes.
- Incomplete crossing - animal moves away from camera but returns within 10 minutes.
- No crossing - animal exhibits no directional movement along the bridge, shows only exploratory movement, or glides from end of bridge.

According to these definitions, a 'complete crossing' does not require complementary evidence of the same crossing event from both cameras. Instead, it is inferred from display of strong directional movement and no evidence of return movement albeit this can be difficult to interpret for the feathertail glider (Acrobates spp.) due to their erratic and rapid movements. The absence of images/footage at the other end of the bridge is presumed to be an instance of detection evasion and is consistent with other researchers investigating arboreal crossing structure use (see Goldingay et al. 2013; Soanes et al. 2015).

For glide pole images/footage, any animal detection on median-positioned glide poles (i.e. GP2 & GP3) was scored as a highway crossing. On occasions when the glide launch was captured, the direction of highway

crossing was also recorded. When detections did not include images/footage of glide launch, a crossing was inferred based on the reasoning that while an individual may glide to the central pole and return to the same side, it likely represents a very small proportion of detections. There is no habitat in the center of the carriageway where GP2 and GP3 are located and, therefore, no apparent reason for gliders to repeatedly access the glide pole without completing a crossing. This is consistent with analyses of glide pole monitoring records from the Hume Highway which were supported by radio-tracking data (see Soanes et al. 2015) and previous glide pole monitoring at Sapphire to Woolgoolga Pacific Highway upgrade (Sandpiper 2018).

For GP1, because it was positioned on the eastern roadside of Solitary Islands Way and adjacent forest habitat, some glider detections likely represent movements along the eastern forest edge and not roadway crossings (see Goldingay et al. 2018). As such, we acknowledge that the sum of glider detections/roadway crossings is likely an overestimate. Other information recorded from glide pole detections included (where discernible): species, sex, tail tip tone (for sugar gliders) and movement type (i.e. explore arm, climb pole, launch east, launch west).

3. Results

3.1 Population monitoring

3.1.1 Sections 1-2

The occupation rate for YbG during 2018 operation phase surveys was zero at control sites, 5% at impact sites and 25% at reference sites. When compared to occupation rates across the other two phases of construction, reference and impact sites demonstrate a rising trend from pre-construction to construction followed by a decline in post-construction (Figure 8). At control sites, YbG have not been detected during construction or operational phase.

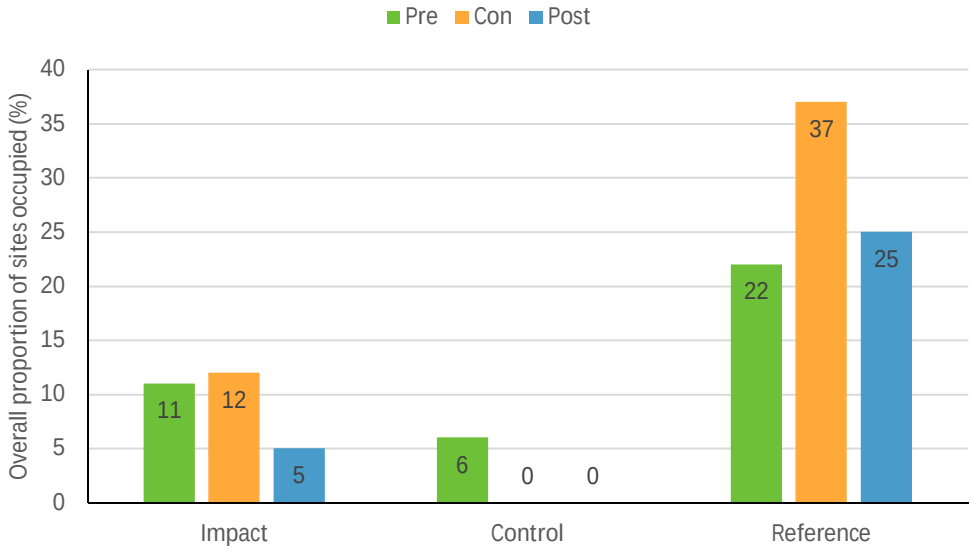

Figure 8: Proportion of impact, control and reference sites occupied by YbG in sections 1-2 according to different phases of construction.

The occupation rate for SqG during the 2018 operation phase surveys ranged from 13% at control sites to 22% at reference sties. Impact sites were 18% occupied over the period. This reflects a mostly rising trend in

occurrence from pre-construction to post-construction phase, particularly for impact and reference sites (Figure 9). This was interspersed by variable results during construction phase across the three treatments. Full details of population survey effort and fauna detections are presented in Appendix A and B.

A Fisher's Exact Test was performed to compare sections 1-2 between pre and post-construction data for YbG and SqG. Output from the Fishers Exact Test revealed that the pre and post-construction occupation rates at impact sites did not differ significantly for YbG (P = 0.437) or SqG (P = 0.182).

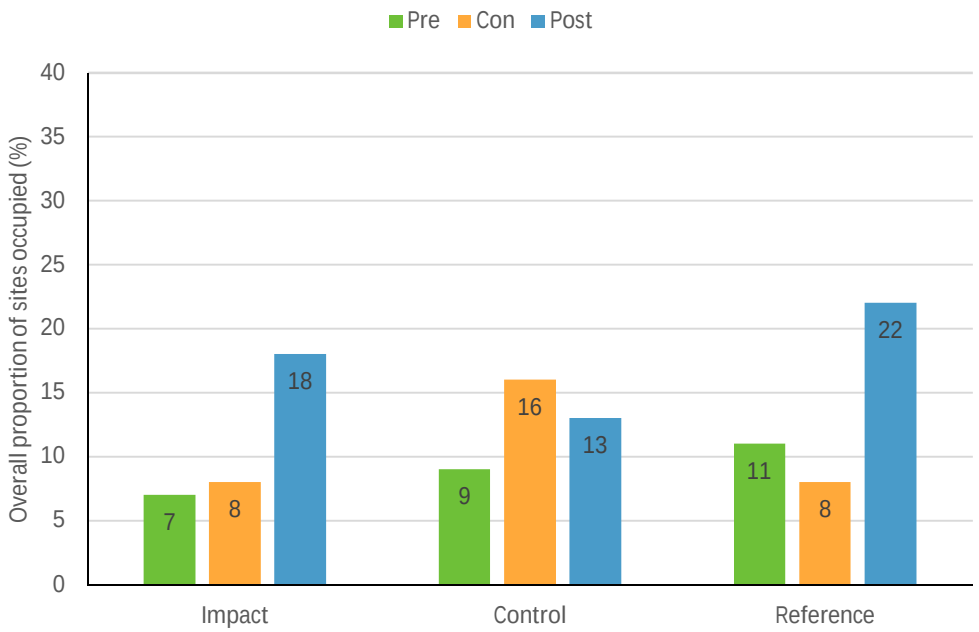

Figure 9: Proportion of impact, control and reference sites occupied by SqG in sections 1-2 according to different phases of construction.

3.1.2 Sections 3-11

All 2018 surveys in sections 3-11 occurred during the construction phase. With the inclusion of 2018 data, the construction phase occupation rate for YbG at impact (10%) and reference sites (8%) remained marginally below that recorded during the pre-construction phase (11% and 10% respectively; Figure 10). This trend is reversed at control sites where a pre-construction value of 4% and construction phase value of 5% was recorded.

The pattern of occupation was the converse for SqG. That is, the occupation rate during the construction phase continued to be higher at impact (21%) and reference sites (35%) compared to pre-construction rates (19% and 28% respectively; Figure 11). This trend was reversed at control sites where a pre-construction occupation rate of 17% and construction phase rate of 14% was recorded.

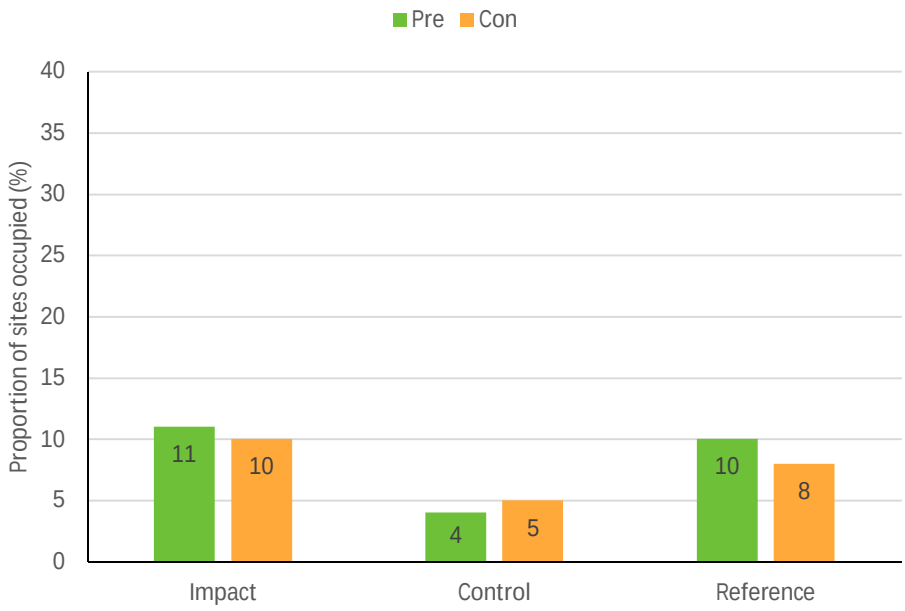

Figure 10: Proportion of impact, control and reference sites occupied by YbG in sections 3-11 according to different phases of construction.

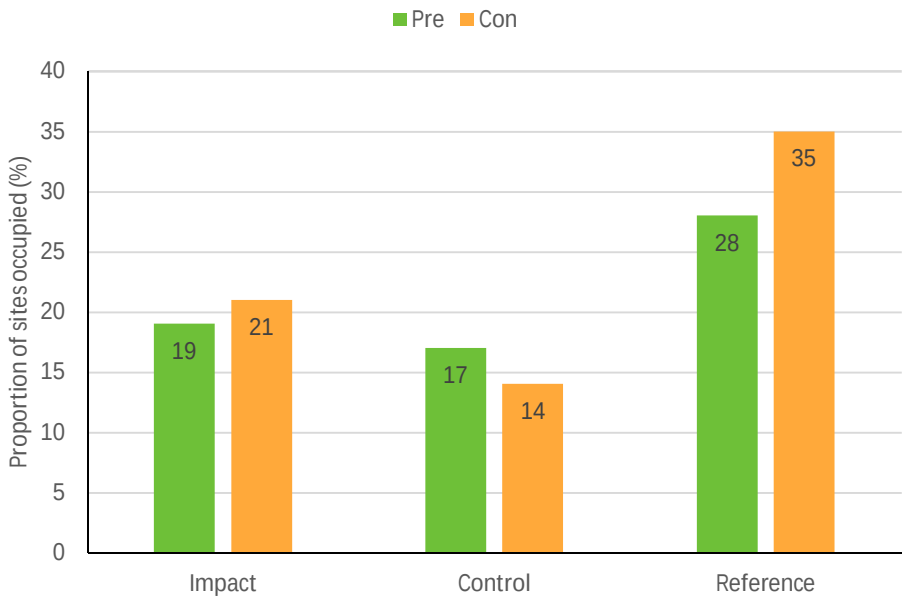

Figure 11: Proportion of impact, control and reference sites occupied by SqG in sections 3-11 according to different phases of construction.

3.2 Arboreal crossing structures and widened medians monitoring

3.2.1 Rope bridges

SqG was detected at RB1 west on one occasion and at RB3 east and west on two occasions (Table 6). On each occasion the individual made either exploratory movements or moved out along the rope bridge and returned (Plate 4). The SqG (adult female) observed making the return movement used both the central webbing and the thick inner rope to move along. YbG were not detected by rope bridge cameras.

Feathertail gliders were detected on 47 occasions amongst RB2, RB3 and RB4 cameras (Table 6). Individuals were recorded making complete crossings in both an easterly and westerly direction at RB3 (16 east, 7 west) and at RB4 (7 east, 3 west) albeit crossings were based on strong directional movement at one camera only (Plate 5). Feathertail glider movements were mostly along the outer thick wire or one of the inner thick ropes (Plate 5).

Table 6: Rope bridge detections. FtG = feathertail glider; SqG = squirrel glider. cc = complete crossing; ic = incomplete crossing; nc = no crossing movement; E = east; W = west.

Rope bridge no.	Camera detections		FtG	SqG	End where detected	Feature of bridge animal moving on
	East	West				
RB1	0	1	0	1ic	SqG at W end only	middle net & thick rope
RB2	2	0	2nc	0	FtG at E end only	at camera
RB3	25	5	23cc (16E,7W); 5nc	2nc	SqG at E & W end; FtG at E & W end	SqG: at camera; FtG: mostly on thick rope
RB4	17	0	10cc (7E,3W); 7nc	0	FtG at E end only	Mostly on thick rope & outer wire rope

Plate 4: A SqG was photographed at the west end of RB1 on one occasion moving east (left) then immediately returning west (right).

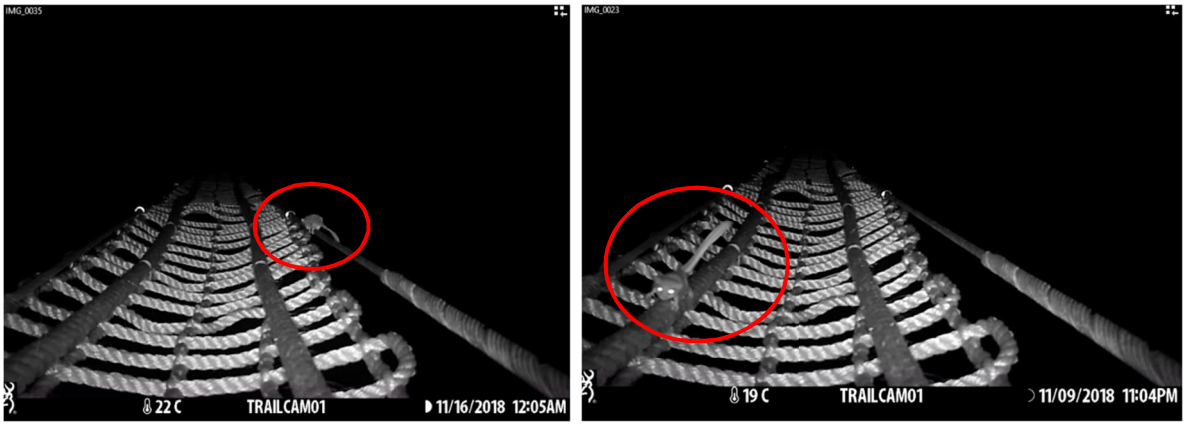

Plate 5: Feathertail gliders were photographed on numerous occasions at RB2, RB3 and RB4. They were mostly observed moving along either the outer thick wire (left) or the thick inner rope (right).

3.2.2 Glide poles

All three glide poles featured detections during Q3 and Q4 2018 (Table 7). SqG was detected at GP3 on five occasions and video footage captured a westward glide launch on one occasion. The individual was observed launching from the inner edge of the parallel arm (Plate 6). Feathertail glider was detected at all three glide poles a total of 63 times (Table 7). Video footage captured glide launches on eight occasions (7 at GP1; 1 at GP2). In particular, feathertail gliders were recorded launching west from GP1 on three occasions which requires a glide distance of 37m to the nearest tree (Plate 7). YbG were not detected by glide pole cameras.

Table 7: Glide pole detections. FtG = feathertail glider; SqG = squirrel glider; E = east; W = west.

Pole no.	Camera detections	FtG	SqG	Antechinus spp.	Position on arm of glide launch
GP1	45	45 (4E, 3W)	0	0	FtG: inner & outer arm edge
GP2	10	8 (1W)	0	1	FtG: outer arm edge
GP3	15	10	5 (1W)	0	SqG: inner arm edge;

Plate 6: A squirrel glider was videoed gliding west off GP3 (Halfway Creek median north) on one occasion.

Plate 7: A feathertail glider was videoed on three occasions gliding west off GP1 (Corindi).

3.2.2 Vegetated medians

SqG/SuG hair was detected in the median of both vegetated median (VM) sites during Q4 and in the median of VM1 during Q3 (Table 8). SqG/SuG hair was also detected in forest on the east side of VMduring Q4. YbG hair was not detected at either median. Other arboreal mammals detected within the median included either short-eared brush-tail possum (Trichosurus caninus) or common brush-tail possum (Trichosurus vulpecula) and yellow-footed Antechinus (Antechinus flavipes) (Table 8).

Table 8: Vegetated median hair funnel detections. Because hair of squirrel glider or sugar glider cannot be confidently differentiated, SqG/SuG refers to either species. D = definite; P = probable.

Species	VM1 east		VM1 median		VM1 west		VM2 east		VM2 median		VM2 west	
	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4
SqG/SuG	D x1	P x1	D x1				D x1	P x1	D x2	P x2		
Brush-tail possum spp.		P x2	D x1	Dx1		P x1						
Yellow-footed antechinus								D x2 P x2		D x1 P x2	P x1	D x3 P x2
Dusky antechinus								P x1		P x1		P x3
Brown antechinus										P x1		
Antechinus spp.				P x1								
Dog/cat/fox				P x1								

3.3 Road mortality

No gliders were recorded during Q3 and Q4 road mortality surveys. One arboreal mammal was recorded during the two periods – a common ringtail (Pseudocheirus peregrinus) on the road shoulder near GP3 (Table 9). The most commonly recorded species was northern brown bandicoot (Isoodon macrourus) which was recorded near GP2 and at VM2 (two individuals). More carcasses were recorded during Q3 (14 individuals) compared to Q4 (four individuals). No threatened species were recorded during surveys.

Table 9: Species identified during road mortality surveys.

Crossing No.	Q3	Q4
RB1/GP1	nil	Egret spp.
RB2	Red-necked wallaby x2; short-beaked echidna	nil
RB3	nil	nil
RB4	nil	nil
GP2	Northern brown bandicoot; kookaburra; med mammal	nil
GP3	Common ringtail possum; magpie; lace monitor	nil
VM1	med mammal	nil
VM2	Northern brown bandicoot x2;	eastern grey kangaroo; wallaby spp. x2
Control 1	barn owl; kookaburra	nil
Control 2	nil	nil
Control 3	nil	nil
Control 4	nil	nil

4. Discussion

4.1 Population monitoring

Comparison of presence/absence across the three phases of construction demonstrate differing occupation trends for the two threatened glider species. YbG occupation rates in sections 1-2 increased from pre-construction to construction and then declined to either equivalent (reference sites) or lower (impact sites) than pre-construction levels during post-construction (i.e. operational phase). The decline was more pronounced at control sites between pre-construction and construction/post-construction. Indeed, YbG have not been detected at control sites since February 2015 during pre-construction surveys. Marginal declines between pre-construction and construction phases were also evident at impact and reference sites in sections 3-11 whereas control sites showed a marginal increase between the two phases. Despite the level of decline at impact sites in sections 1-2, the results of the Fishers Exact Test showed that proportions did not differ significantly between the pre and post-construction phases. This result is likely influenced by the combination of moderate site replication and low number of YbG records which constrains the power to detect significant differences. The precision of statistical tests will likely improve as more post-construction data are acquired.

A similar pattern of decline in YbG detections between 2014 and 2018 has been reported at reference and impact sites associated with the Warrell Creek to Nambucca Heads (WC2NH) Pacific Highway upgrade (Sandpiper 2018 unpub. data). YbG abundance is sensitive to changes in climatic conditions driven by rainfall which trigger variations in food availability (Goldingay 1992). Rainfall data from Lower Bucca (the closest long-term weather station to sections 1-2) shows that rainfall for the three years preceding 2014 baseline surveys were 28-41% above average whereas rainfall for the three years preceding the 2018 surveys ranged between 22% below and 27% above average (Bureau of Meteorology). It is possible that the variable rainfall conditions since 2014 has affected population numbers. Data from subsequent monitoring years should provide greater clarity on this association.

Occupation rates for SqG paint a different picture to that of YbG. Occupation rates for SqG within sections 1-2 suggest a trend of increasing occurrence across all treatments from pre-construction to operation phase, particularly at impact and reference sites. This was largely mirrored at sections 3-11 where occupation rates have risen above pre-construction levels for both impact and reference sites. The recent trend in SqG occupation rates suggests that they are responding to recent local conditions and potential disruptions caused by the highway upgrade differently to YbG. It may reflect species-specific responses to other ecological factors such as flowering events, loss of key food and denning resources, or loss of access between habitat resources either side of the highway (see Sharpe & Goldingay 1998; Taylor & Goldingay 2012). Indeed, the spatially patchy distribution of SqG and YbG across the W2B alignment means that clearing impacts will not be evenly spread across the highway corridor.

4.1.1 Performance indicator

1. Decline in the after-construction occupancy rates of squirrel glider or yellow-bellied glider at impact sites over three consecutive monitoring sessions.

    a. 55% decline in YbG occupation rate between pre-construction and post-construction in sections 1-2.

    b. 100% increase in SqG occupation rate between pre-construction and post-construction in sections 1-2.

4.2 Use of rope bridges, glide poles and vegetated median

4.2.1 Use of rope bridges

A range of arboreal and scansorial species, including squirrel, sugar and feathertail gliders, common brushtail and common ringtail possums, brush-tailed phascogale and Antechinus spp. have been recorded using rope bridges at sites along the Pacific and Hume Highways (Goldingay et al. 2013; Soanes et al. 2015; Sandpiper 2017, 2018b). SqG and feathertail glider were recorded on sections 1-2 rope bridges during the two quarters of monitoring. The video images of SqG at RB1 and RB3 show exploratory movement and do not suggest a crossing was made. YbG were not detected by rope bridge cameras.

Footage of feathertail gliders at RB3 and RB4 suggest that numerous crossings in both directions were completed. While these are encouraging records, they should be interpreted cautiously. Because of their small size (approximately 15g) and rapid and erratic movement pattern, it is likely that feathertail gliders often evade camera detection. In doing so, some records of complete crossings may have been instances when individuals did not complete crossings but returned and evaded camera detection or returned and glided off the rope bridge back to the support pole or adjacent vegetation before being detected (see Goldingay et al. 2013; Sandpiper Ecological 2017b, 2018b). The lack of concurrent footage of individuals at the other end of the rope bridge further supports a cautious approach. Continued monitoring should assist in better understanding the extent of feathertail glider movement.

4.2.2 Use of glide poles

Glide poles are another type of aerial crossing that has proven effective in enabling feathertail gliders, sugar gliders, squirrel gliders and probably yellow-bellied gliders to cross dual carriageways (Soanes et al. 2015; Goldingay et al. 2018; Taylor & Goldingay 2012, 2013; Sandpiper 2018b). Monitoring of the three glide poles in sections 1-2 revealed numerous highway crossings at Halfway Creek by SqG and feathertail glider and at least three confirmed crossings of the two-lane Solitary Islands Way by feathertail glider. Cameras are only installed on one of the two cross arms (parallel) and launches that may be occurring from the other glide arm are not being recorded. The choice of arm to monitor was largely informed by results of glide pole monitoring for the Sapphire to Woolgoolga upgrade (Sandpiper 2018b) which demonstrated a preference for the parallel arm by SqG and sugar gliders. Feathertail gliders showed a preference for the perpendicular arm. It is not known what the glide arm preference (if any) is for YbG. Moreover, it is not known if glide arm preference is site specific or affected by the required glide distance to cross the road-gap.

The feathertail glider records are interesting, particularly at GP1. To cross Solitary Islands Way requires a glide of approximately 37m to the closest tree trunk which, when launching from a height of 17m, is at the extreme end of their reported glide capacity (see Pridmore & Hoffmann 2014; Goldingay et al. 2018). The observed westward launch across the carriageway at GP2 only requires a glide of 20m from a height of 19m which is well within the reported glide capacity of this species. Further, it is likely that many of the 45 feathertail glider detections at GP1 were related to movements within and along the eastern roadside vegetation.

4.2.3 Use of vegetated median

Vegetated medians are designed to provide an opportunity for gliding mammals to cross highway corridors. Use of such highway features have been reported for SqG along the Hume Highway (van der Ree et al. 2010) and SqG and sugar gliders along the Pacific Highway (Sandpiper 2018b; Taylor & Rohweder 2013). SqG and/or sugar glider hair was detected within both vegetated medians and vegetation east of each median. Forest habitat on the west side of both medians is fragmented by service roads although it is likely they support SqG

and probably YbG. Further monitoring should confirm whether either/both species are using the western roadside habitat. Use of vegetated medians by non-volant arboreal species such as Antechinus spp. and brushtail possum spp. (Trichosurus spp.) is unsurprising given the habitat type. Non-volant arboreal species can readily access either median by climbing fences adjacent underpasses.

4.2.3 Performance indicator

1. No evidence of use of arboreal crossing structures and widened medians by threatened gliders post-construction.
    a. Use of glide pole by SqG to cross highway at GP3.
    b. Incomplete crossing of highway by SqG at RB1 and exploratory movement at RB3.
    c. SqG/SuG hair detected within both vegetated medians.

4.3 Road mortality

The extent of glider road mortality is largely unknown (Soanes et al. 2015) and reportedly infrequent (see Taylor & Goldingay 2012). No gliders were recorded during Q3 and Q4 road mortality surveys and only one arboreal mammal was recorded - common ringtail possum near GP3. No fauna fencing occurred in the vicinity of GP3 and common ringtail possums readily move along ground. They are also common victims of road mortality (Taylor & Goldingay 2004).

4.3.1 Performance indicator

1. Higher mortality rate at impact sites or no significant difference in mortality rates for threatened gliders between impact and control sites.
    a. No reported threatened glider road mortalities.
2. High number of incidental records of threatened glider mortality away from crossing structures.
    a. No reported threatened glider road mortalities away from crossing structures in sections 1-2.

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Appendix A – Survey Effort and Weather Conditions

Table A1: Survey effort and weather data for Q1 2018 threatened glider monitoring. Msb = wind moves small branches; MLB = wind moves large branches. Ns = not surveyed

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
TabLB-ie	12/2/18	2	MJ	27	94	10	Nil	Nil	0/4	2110	2145
	14/2/18	3	SJ	26	88	Nil	RL	Nil	0/4	2155	2230
TabLB-iw	12/2/18	2	NP	27	94	10	Nil	Nil	0/4	2110	2145
	14/2/18	3	MJ	26	88	Nil	RL	Nil	0/4	2155	2230
TabNR-rn	12/2/18	1	MJ	27	94	10	Nil	Nil	0/4	2020	2050
	14/2/18	3	NP	26	88	Nil	RL	Nil	0/4	2155	2230
TabNR-rs	12/2/18	1	NP	27	94	10	Nil	Nil	0/4	2020	2050
	14/2/18	4	MJ	26	90	0	Nil	Nil	0/4	2255	2330
TabVM-ie	12/2/18	3	MJ	25.2	93	20	Nil	Nil	0/4	2200	2239
	14/2/18	4	NP	26	90	0	Nil	Nil	0/4	2255	2330
TabVM-iw	12/2/18	3	NP	25.2	93	20	Nil	Nil	0/4	2200	2239
	14/2/18	4	SJ	26	90	0	Nil	Nil	0/4	2255	2330
TabN-ie	12/2/18	4	MJ	25.2	93	20	Nil	Nil	0/4	2247	2320
	14/2/18	2	NP	28	80	Nil	Msb	Nil	0/4	2108	2145
TabN-iw	12/2/18	4	NP	25.2	93	20	Nil	Nil	0/4	2247	2320
	14/2/18	2	SJ	28	80	Nil	Msb	Nil	0/4	2108	2108
TabN-ce	12/2/18	6	MJ	25.5	93	Nil	Msb	Nil	0/4	0010	0041
	14/2/18	1	SJ	28	80	Nil	Msb	Nil	0/4	2015	2050
TabN-cw	12/2/18	6	NP	25.5	93	Nil	Msb	Nil	0/4	0010	0041
	14/2/18	2	MJ	28	80	Nil	Msb	Nil	0/4	2015	2050
TabDD-rn	12/2/18	5	MJ	25.5	93	Nil	Msb	Nil	0/4	2330	0004
	14/2/18	1	NP	28	80	Nil	Msb	Nil	0/4	2015	2050
TabDD-rs	12/2/18	5	NP	25.5	93	Nil	Msb	Nil	0/4	2330	0004
	14/2/18	1	MJ	28	80	Nil	Msb	Nil	0/4	2015	2050
TabM-ce	13/2/18	7	MJ	24.1	91	0	Nil	Nil	0/4	0110	0143
	15/2/18	3	SJ	25.2	95	50	Nil	Nil	0/4	2145	2220
TabM-cw	13/2/18	7	NP	24.1	91	0	Nil	Nil	0/4	0110	0143
	15/2/18	3	NP	25.2	95	50	Nil	Nil	0/4	2145	2220
TabM-ie	13/2/18	6	MJ	24.8	91	0	Nil	Nil	0/4	0030	0100
	15/2/18	2	NP	26	90	0	Nil	Nil	0/4	2100	2135
TabM-iw	13/2/18	6	NP	24.8	91	0	Nil	Nil	0/4	0030	0100
	15/2/18	2	SJ	26	90	0	Nil	Nil	0/4	2100	2135
TabS-ie	13/2/18	5	MJ	24.8	91	0	Nil	Nil	0/4	2340	0020
	15/2/18	1	NP	27	90	50	Nil	Nil	0/4	2015	2050
TabS-iw	13/2/18	5	NP	24.8	91	0	Nil	Nil	0/4	2340	0020
	15/2/18	1	SJ	26	90	0	Nil	Nil	0/4	2015	2050
TabS-ce	13/2/18	4	MJ	26	98	20	Msb	Nil	0/4	2300	2330
	15/2/18	4	NP	25.2	95	50	Nil	Nil	0/4	2235	2315
TabS-cw	13/2/18	4	NP	26	98	20	Msb	Nil	0/4	2300	2330
	15/2/18	4	SJ	25.2	95	50	Nil	Nil	0/4	2235	2315
MOR-ie	13/2/18	2	MJ	26.2	98	20	Rl	Nil	0/4	2015	2100
	15/2/18	5	NP	26	99	50	Nil	Nil	0/4	2335	0015
MOR-iw	13/2/18	3	NP	26	98	20	Msb	Nil	0/4	2210	2250
	15/2/18	7	NP	26.1	99	50	Nil	Nil	0/4	0150	0225
MOR-ce	13/2/18	1	MJ	26.2	98	20	Rl	Nil	0/4	2015	2100
	15/2/18	6	NP	26.1	99	50	Nil	Nil	0/4	0110	0145
MOR-cw	13/2/18	3	MJ	26	98	20	Msb	Nil	0/4	2210	2250
	15/2/18	7	SJ	26.1	99	50	Nil	Nil	0/4	0150	0225
MOR-rn	13/2/18	2	NP	26.2	98	20	Rl	Nil	0/4	2122	2155
	15/2/18	5	SJ	26	99	50	Nil	Nil	0/4	2335	0015
MOR-rs	13/2/18	1	NP	26.2	98	20	Rl	Nil	0/4	2015	2100
	15/2/18	6	SJ	26.1	99	50	Nil	Nil	0/4	0110	0145
TucN-ce	19/2/18	1	NP	24.7	70	100	Nil	Nil	0/4	2010	2100
	21/2/18	5	SJ	20.1	85	30	Nil	Nil	0/4	2350	0030
TucN-cw	19/2/18	1	SJ	24.7	70	100	Nil	Nil	0/4	2010	2100
	21/2/18	5	NP	20.1	85	30	Nil	Nil	0/4	2350	0030
TucM-ce	19/2/18	2	NP	24.7	70	100	Nil	Nil	0/4	2110	2150

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
	21/2/18	4	SJ	20.1	85	30	Nil	Nil	0/4	2305	2338
TucM-cw	19/2/18	2	SJ	24.7	70	100	Nil	Nil	0/4	2110	2150
	21/2/18	4	NP	20.1	85	30	Nil	Nil	0/4	2305	2338
Tuc-r-n	19/2/18	3	SJ	23.5	76	100	Nil	Nil	0/4	2210	2245
	21/2/18	3	NP	20.1	85	30	Nil	Nil	0/4	2201	2239
Tuc-r-s	19/2/18	3	NP	23.5	76	100	Nil	Nil	0/4	2210	2245
	21/2/18	3	SJ	20.1	85	30	Nil	Nil	0/4	2201	2239
TucS-ce	19/2/18	4	NP	23.5	76	100	Nil	Nil	0/4	2300	2340
	21/2/18	2	SJ	23.6	57	30	Nil	Nil	0/4	2105	2145
TucS-cw	19/2/18	4	SJ	23.5	76	100	Nil	Nil	0/4	2300	2340
	21/2/18	2	NP	23.6	57	30	Nil	Nil	0/4	2105	2145
TucN-ie	19/2/18	5	NP	23.1	78	100	MLB	Nil	0/4	2350	0032
	21/2/18	1	SJ	23.6	57	30	Nil	Nil	0/4	2010	2100
TucN-iw	19/2/18	5	SJ	23.1	78	100	MLB	Nil	0/4	2350	0032
	21/2/18	1	NP	23.6	57	30	Nil	Nil	0/4	2010	2100
TucS-ie	22/2/18	5	NP	21.9	79	100	Nil	Light	1/4	0010	0100
	28/2/18	1	SJ	23	67	Nil	Nil	Nil	2/4	2010	2045
TucS-iw	22/2/18	5	SJ	21.9	79	100	Nil	Light	1/4	0010	0100
	22/2/18	1	MJ	23	67	Nil	Nil	Nil	2/4	2010	2045
GN-ce	22/2/18	3	NP	22.1	78	100	Nil	Nil	1/4	2215	2250
	28/2/18	2	SJ	21.7	72	Nil	Msb	Nil	2/4	2130	2200
GN-cw	22/2/18	3	SJ	22.1	78	Nil	Nil	Nil	1/4	2215	2250
	28/2/18	2	MJ	21.7	72	Nil	Msb	Nil	2/4	2130	2200
GN-ie	22/2/18	4	NP	22.1	78	100	Nil	Nil	1/4	2300	2340
	28/2/12	3	SJ	20.5	79	Nil	Msb	Nil	2/4	2212	2244
GN-iw	22/2/18	4	SJ	22.1	78	100	Nil	Nil	1/4	2300	2340
	28/2/18	3	MJ	20.5	79	Nil	Msb	Nil	2/4	2212	2244
GS-ie	Ns										
	Ns										
GS-iw	Ns										
	Ns										
GS-ce	22/2/18	2	NP	23.6	66	100	Nil	Nil	1/4	2100	2150
	28/2/18	4	SJ	19.6	83	Nil	Msb	Nil	2/4	2322	2355
GS-cw	22/2/18	2	SJ	23.6	66	100	Nil	Nil	1/4	2100	2150
	28/2/18	4	MJ	19.6	83	Nil	Msb	Nil	2/4	2322	2355
G-r-n	22/2/18	1	NP	23.6	66	100	Nil	Nil	1/4	2010	2050
	28/2/18	5	SJ	18.8	87	Nil	Msb	Nil	2/4	0030	0105
G-r-s	22/2/18	1	SJ	23.6	66	100	Nil	Nil	1/4	2010	2050
	28/2/18	5	MJ	18.9	87	Nil	Msb	Nil	2/4	0025	0055
S3/M2-ce	27/2/18	1	MJ	20.5	77	5	Msb	Nil	2/4	2045	2120
	1/3/18	4	SJ	23.8	73	100	MSB	Nil	2/4	2243	2315
S3/M2-cw	27/2/18	1	SJ	20.5	77	5	Msb	Nil	2/4	2045	2120
	1/3/18	4	MJ	23.8	73	100	MSB	Nil	2/4	2250	2320
S3/M2-re	27/2/18	3	MJ	18.8	85	5	Msb	Nil	2/4	2230	2300
	1/3/18	6	SJ	23.1	74	100	MLB	Nil	2/4	0030	0100
S3/M2-rw	27/2/18	3	SJ	18.8	85	5	Msb	Nil	2/4	2225	2255
	1/3/18	6	MJ	23.1	74	100	MLB	Nil	2/4	0023	0055
S3-ie	27/2/18	2	MJ	19	82	5	Msb	Nil	2/4	2135	2210
	1/3/18	5	SJ	23.8	73	100	Msb	Nil	2/4	2330	0005
S3-iw	27/2/18	2	SJ	19	82	5	Msb	Nil	2/4	2135	2215
	1/3/18	5	MJ	23.8	73	100	Msb	Nil	2/4	2335	0010
M2-i	27/2/18	1	NP	22.4	73	20	Nil	Nil	3/4	2035	2107
	1/3/18	6	NP	23.4	83	100	Msb	Nil	4/4	2335	0005
C3-re	27/2/18	2	NP	22.4	73	20	Nil	Nil	3/4	2115	2147
	1/3/18	5	NP	23.4	83	100	Msb	Nil	4/4	2250	2327
C3-rw	27/2/18	3	NP	21.2	82	20	Nil	Nil	3/4	2155	2230
	1/3/18	4	NP	24.6	71	100	MLB	Nil	4/4	2205	2240
C3-ce	27/2/18	4	SJ	18	88	10	Msb	Nil	2/4	2320	2350
	1/3/18	3	MJ	25.5	72	100	MLB	Nil	2/4	2150	2220
C3-cw	27/2/18	4	MJ	18	88	10	Msb	Nil	2/4	2320	2350
	1/3/18	3	SJ	24.5	72	100	MLB	Nil	2/4	2150	2220
C3-ie	27/2/18	5	MJ	17.8	90	10	Msb	Nil	2/4	0010	0040
	1/3/18	2	SJ	24.8	70	95	MLB	Nil	2/4	2105	2138
C3-iw	27/2/18	5	SJ	17.8	90	10	Msb	Nil	2/4	0010	0040

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
	1/3/18	2	MJ	24.8	70	95	MLB	Nil	2/4	2105	2138
C2-c	27/2/18	4	NP	21.2	82	20	MLB	Nil	3/4	2245	2315
	1/3/18	3	NP	24.6	71	100	MLB	Nil	4/4	2127	2200
C2-rn	27/2/18	6	SJ	17.4	92	50	Msb	Nil	2/4	0055	0125
	1/3/18	1	MJ	24.8	70	90	MLB	Nl	2/4	2008	2038
C2-rs	27/2/18	6	MJ	17.4	92	50	Msb	Nil	2/4	0100	0130
	1/3/18	1	SJ	24.8	70	90	MLB	Nil	2/4	2000	2045
C2-ie	28/2/18	6	MJ	18.7	89	Nil	Msb	Nil	2/4	0146	0215
	2/3/18	1	NP	22.6	73	100	Nil	Nil	4/4	1955	2026
C2-iw	28/2/18	6	SJ	18.7	89	Nil	Msb	Nil	2/4	0152	0225
	2/3/18	1	SJ	22.6	73	100	Nil	Nil	4/4	2005	2040
S2/M1-c	27/2/18	5	NP	20.9	84	20	Msb	Nil	3/4	2325	0005
	1/3/18	1	NP	24.2	76	100	MLB	Nil	4/4	2005	2037
S2/M1-r	28/2/18	1	NP	23.7	70	0	Nil	Nil	3/4	2005	2040
	2/3/18	2	NP/SJ	22.6	73	100	Nil	LDriz	4/4	2045	2105
S2-i	27/2/18	6	NP	19.9	90	60	Nil	Nil	3/4	0015	0050
	1/3/18	2	NP	24.2	76	100	MLB	Nil	4/4	2045	2217
M1-i	Ns										
	Ns										
C1-ie	28/2/18	2	NP	23.7	70	0	Nil	Nil	3/4	2050	2120
	2/3/18	3	NP	21.8	86	100	Nil	Ldriz	4/4	2117	2147
C1-iw	28/2/18	3	NP	23.2	72	0	Nil	Nil	3/4	2125	2200
	2/3/18	3	SJ	21.8	86	100	Nil	Ldriz	4/4	2117	2147
C1-rn	28/2/18	4	NP	23.2	72	0	Nil	Nil	3/4	2205	2238
	2/3/18	4	NP	21.8	86	100	Nil	Ldriz	4/4	2150	2230
C1-rs	28/2/18	5	NP	22.3	76	0	Nil	Nil	3/4	2245	2321
	2/3/18	4	SJ	21.8	86	100	Nil	Ldriz	4/4	2150	2230
C1-ce	28/2/18	6	NP	22.3	76	0	Nil	Nil	3/4	2330	0000
	2/3/18	3	NP	21.7	87	100	Nil	Nil	4/4	2240	2330
C1-cw	28/2/18	7	NP	22.3	76	0	Nil	Nil	3/4	0005	0045
	2/3/18	3	SJ	21.7	87	100	Nil	Nil	4/4	2240	2330

Table A2: Survey effort and weather data for Q2 2018 threatened glider monitoring. Msb = wind moves small branches; MLB = wind moves large branches. Ns = not surveyed

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
TabLB-ie	12/6/18	2	SJ	16.2	74	0	Msb	Nil	New	1822	1857
	14/6/18	5	NP	13.3	82	0	Rl	Nil	New	2120	2149
TabLB-iw	12/6/18	2	NP	16.2	74	0	Msb	Nil	New	1822	1857
	14/6/18	5	SJ	13.3	82	0	Rl	Nil	New	2120	2149
TabNR-rn	12/6/18	1	SJ	16.2	74	0	Msb	Nil	New	1740	1813
	14/6/18	6	NP	13.3	82	0	Rl	Nil	New	2210	2242
TabNR-rs	12/6/18	1	NP	16.2	74	0	Msb	Nil	New	1740	1812
	14/6/18	6	SJ	13.3	82	0	Rl	Nil	New	2210	2242
TabVM-ie	12/6/18	3	SJ	14.9	76	0	Rl	Nil	New	1910	1947
	14/6/18	7	NP	10	63	0	Nil	Nil	New	2255	2327
TabVM-iw	12/6/18	3	NP	14.9	76	0	Rl	Nil	New	1910	1947
	14/6/18	7	SJ	10	63	0	Nil	Nil	New	2255	2330
TabN-ie	12/6/18	4	SJ	14.9	76	0	Rl	Nil	New	2000	2030
	14/6/18	4	NP	15.4	70	0	Nil	Nil	New	2028	2105
TabN-iw	12/6/18	4	NP	14.9	76	0	Rl	Nil	New	2000	2030
	14/6/18	4	SJ	15.4	70	0	Nil	Nil	New	2028	2105
TabN-ce	12/6/18	6	SJ	13	82	0	Nil	Nil	New	2135	2208
	14/6/18	2	NP	16.1	67	0	Nil	Nil	New	1845	1917
TabN-cw	12/6/18	6	NP	13	82	0	Nil	Nil	New	2135	2208
	14/6/18	2	SJ	16.1	67	0	Nil	Nil	New	1845	1917
TabDD-rn	12/6/18	5	SJ	13.9	78	0	Nil	Nil	New	2044	2129
	14/6/18	3	NP	15.4	70	0	Nil	Nil	New	1930	1810
TabDD-rs	12/6/18	5	NP	13.9	78	0	Nil	Nil	New	2044	2130
	14/6/18	3	SJ	15.4	70	0	Nil	Nil	New	1930	1810
TabM-ce	13/6/18	2	SJ	17.7	79	0	Nil	Nil	New	1845	1925
	15/6/18	6	SJ	9	79	0	RL	Nil	New	2218	2250
TabM-cw	13/6/18	2	NP	17.7	79	0	Nil	Nil	New	1845	1925
	15/6/18	6	NP	9	79	0	RL	Nil	New	2218	2250
TabM-ie	13/6/18	1	SJ	17.7	79	0	Nil	Nil	New	1743	1723
	15/6/18	5	NP	9	79	0	RL	Nil	New	2125	2155
TabM-iw	13/6/18	1	NP	17.7	79	0	Nil	Nil	New	1743	1723
	15/6/18	5	SJ	9	79	0	RL	Nil	New	2125	2155
TabS-ie	12/6/18	7	SJ	13.1	81	0	Nil	Nil	New	2225	2255
	14/6/18	1	NP	16.1	67	0	Nil	Nil	New	1740	1820
TabS-iw	12/6/18	7	NP	13.1	81	0	Nil	Nil	New	2225	2255
	14/6/18	1	SJ	16.1	67	0	Nil	Nil	New	1740	1820
TabS-ce	13/6/18	3	SJ	16.6	71	0	Msb	Nil	New	1950	2026
	15/6/18	4	NP	12.5	72	0	RL	Nil	New	2028	2101
TabS-cw	13/6/17	3	NP	16.6	71	0	Msb	Nil	New	1950	2026
	15/6/18	4	SJ	12.5	72	0	RL	Nil	New	2025	2100
MOR-ie	13/6/18	5	SJ	16.6	71	0	Msb	Nil	New	2138	2209
	15/6/18	3	NP	12.5	72	0	RL	Nil	New	1923	1959
MOR-iw	13/6/18	6	NP	16.9	65	100	Nil	Nil	New	2235	2308
	15/6/18	1	NP	16.3	55	0	Nil	Nil	New	1742	1816
MOR-ce	13/6/18	4	SJ	16.6	71	0	Msb	Nil	New	2035	2116
	15/6/18	2	NP	16.3	55	0	Nil	Nil	New	1830	1910
MOR-cw	13/6/18	6	SJ	16.9	65	0	Nil	Nil	New	2235	2308
	15/6/18	1	SJ	16.3	55	0	Nil	Nil	New	1740	1820
MOR-rn	13/6/18	5	NP	16.6	71	0	Msb	Nil	New	2138	2209
	15/6/18	3	SJ	12.5	72	0	RL	Nil	New	1928	2005
MOR-rs	13/6/18	4	NP	16.6	71	0	Msb	Nil	New	2035	2116
	15/6/18	2	SJ	16.3	55	0	Nil	Nil	New	1830	1905
TucN-ce	18/6/18	1	MJ	14.8	46	100	MLB	Nil	1/4	1740	1820
	20/6/18	6	NP	13	70	90	RL	Nil	1/4	2210	2243
TucN-cw	18/6/18	1	NP	14.8	46	100	MLB	Nil	1/4	1740	1820
	20/6/18	6	MJ	13	70	90	RL	Nil	1/4	2210	2243
TucM-ce	18/6/18	2	MJ	14.8	46	100	MLB	Nil	1/4	1840	1913
	20/6/18	5	NP	13	70	90	RL	Nil	1/4	2125	2156
TucM-cw	18/6/18	2	NP	14.8	46	100	MLB	Nil	1/4	1840	1913
	20/6/18	5	MJ	13	70	90	RL	Nil	1/4	2125	2156
Tuc-r-n	18/6/18	3	NP	14.5	49	90	MSB	Nil	1/4	1935	2015
	20/6/18	4	MJ	13	72	40	RL	Nil	1/4	2025	2104

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
Tuc-r-s	18/6/18	3	MJ	14.5	49	90	MSB	Nil	1/4	1935	2015
	20/6/18	4	NP	13	72	40	RL	Nil	1/4	2025	2104
TucS-ce	18/6/18	4	MJ	14.5	49	90	RL	Nil	1/4	2025	2100
	20/6/18	3	NP	13	72	40	RL	Nil	1/4	1945	2018
TucS-cw	18/6/18	4	NP	14.5	49	90	RL	Nil	1/4	2025	2100
	20/6/18	3	MJ	13	72	40	RL	Nil	1/4	1945	2018
TucN-ie	18/6/18	5	MJ	12.6	54	0	Nil	Nil	1/4	2106	2145
	20/6/18	2	NP	14	65	20	Nil	Nil	1/4	1903	1937
TucN-iw	18/6/18	5	NP	12.6	54	0	Nil	Nil	1/4	2106	2145
	20/6/18	2	MJ	14	65	20	Nil	Nil	1/4	1903	1937
TucS-ie	18/6/18	6	MJ	12.6	54	0	Nil	Nil	1/4	2200	2243
	20/6/18	1	NP	14	65	20	Nil	Nil	1/4	1800	1835
TucS-iw	18/6/18	6	NP	12.6	54	0	Nil	Nil	1/4	2200	2243
	20/6/18	1	MJ	14	65	20	Nil	Nil	1/4	1800	1837
GN-ce	19/6/18	5	MJ	9.6	71	0	Nil	Nil	1/4	2210	2245
	21/6/18	1	NP	15.3	64	0	Nil	Nil	3/4	1740	1818
GN-cw	19/6/18	5	NP	9.6	71	0	Nil	Nil	1/4	2210	2245
	21/6/18	1	DR	15.3	64	0	Nil	Nil	3/4	1740	1818
GN-ie	19/6/18	6	MJ	9.6	71	0	Nil	Nil	1/4	2125	2200
	21/6/18	2	NP	15.3	64	0	Nil	Nil	3/4	1843	1915
GN-iw	19/6/18	6	NP	9.6	71	0	Nil	Nil	1/4	2125	2200
	21/6/18	2	DR	15.3	64	0	Nil	Nil	3/4	1843	1915
GS-ie	19/6/18	4	MJ	12.8	57	10	Nil	Nil	1/4	2019	2055
	16/7/18	1	BT	13.5	60	10	Nil	Nil	0/4	1755	1826
GS-iw	19/6/18	4	NP	12.8	57	10	Nil	Nil	1/4	2025	2100
	16/7/18	1	MJ	13.5	60	10	Nil	Nil	0/4	1755	1826
GS-ce	19/6/18	3	MJ	12.8	57	10	Nil	Nil	1/4	1930	2000
	21/6/18	4	NP	10	86	0	RL	Nil	3/4	2050	2130
GS-cw	19/6/18	3	NP	12.8	57	10	Nil	Nil	1/4	1932	2005
	21/6/18	4	DR	10	86	0	RL	Nil	3/4	2050	2130
G-r-n	19/6/18	2	NP	15	47	20	Nil	Nil	1/4	1844	1914
	21/6/18	3	DR	10	86	0	RL	Nil	3/4	1940	2020
G-r-s	19/6/18	2	MJ	15	47	20	Nil	Nil	1/4	1840	1910
	21/6/18	3	NP	10	86	0	RL	Nil	3/4	1940	2020
S3/M2-ce	19/6/18	1	MJ	15	47	20	Nil	Nil	1/4	1740	1817
	21/6/18	5	NP	9.8	89	10	Nil	Nil	3/4	2152	2235
S3/M2-cw	19/6/18	1	NP	15	47	20	Nil	Nil	1/4	1740	1817
	21/6/18	5	DR	9.8	89	10	Nil	Nil	3/4	2152	2238
S3/M2-re	3/7/18	2	MJ	16	74	60	MLB	Nil	3/4	1840	1915
		7	NP								
S3/M2-rw	3/7/18	2	NP	16	74	60	MLB	Nil	3/4	1840	1915
		6	NP								
S3-ie	3/7/18	1	MJ	16	74	60	MLB	Driz	3/4	1745	1830
	16/7/18	2	BT	13.5	60	10	Nil	Nil	0/4	1801	1834
S3-iw	3/7/18	1	NP	16	74	60	MLB	Driz	3/4	1745	1830
	16/7/18	2	MJ	13.5	60	10	Nil	Nil	0/4	1801	1834
M2-i	3/7/18	3	NP	15	79	40	Msb	Nil	3/4	1925	2000
	5/7/18	4	MJ	17	98	100	Nil	Fog	3/4	2100	2135
C3-re	3/7/18	3	MJ	15	79	40	Msb	Nil	3/4	1930	2010
	5/7/18	4	NP	17	97	100	Nil	Fog	3/4	2100	2135
C3-rw	3/7/18	44	NP/MJ	15	79	40	Msb	Nil	3/4	2030	2050
	5/7/18	33	NP/MJ	17	97	100	Nil	Fog	3/4	2035	2050
C3-ce	3/7/18	5	MJ	15	78	30	Msb	Light	3/4	2055	2130
	16/7/18	3	BT	10.4	63	5	Nil	Nil	0/4	1945	2017
C3-cw	3/7/18	5	NP	15	78	30	Msb	Light	3/4	2055	2130
	16/7/18	3	MJ	10.4	63	5	Nil	Nil	0/4	1945	2017
C3-ie	3/7/18	6	MJ	15	78	30	MLB	Light	3/4	2140	2220
	5/7/18	2	NP	18	98	100	Nil	Driz	3/4	1945	2020
C3-iw	3/7/18	6	NP	15	78	30	MLB	Light	3/4	2140	2220
	5/7/18	2	MJ	18	98	100	Nil	Driz	3/4	1945	2020
C2-c	3/7/18	77	NP/MJ	15	79	40	MLB	Light	3/4	2240	2300
	5/7/18	11	NP/MJ	18	98	100	Nil	Driz	3/4	1917	1935
C2-rn	4/7/18	4	NP	18	88	70	RL	Nil	3/4	1940	2020
		5	NP								
C2-rs	4/7/18	4	MJ	18	88	70	RL	Nil	3/4	1940	2020

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
		4	NP								
C2-ie	4/7/18	5	MJ	17	93	50	Nil	Nil	3/4	2030	2105
	16/7/18	4	BT	10.4	63	5	Nil	Nil	0/4	2040	2111
C2-iw	4/7/18	5	NP	17	93	50	Nil	Nil	3/4	2030	2105
	16/7/18	4	MJ	10.4	63	5	Nil	Nil	0/4	2040	2111
S2/M1-c	4/7/18	66	NP/MJ	17	93	50	Nil	Nil	3/4	2110	2130
		3	NP								
S2/M1-r	4/7/18	33	NP/MJ	18	88	70	RL	Nil	3/4	1915	1930
		2	NP								
S2-i	4/7/18	22	NP/MJ	17	94	80	RL	Nil	3/4	1835	1855
		1	NP								
M1-i	Ns										
	ns										
C1-ie	4/7/18	1	MJ	17	94	80	RL	Nil	3/4	1740	1820
	16/7/18	6	BT	10.4	63	5	Msb	Nil	0/4	2234	2305
C1-iw	4/7/18	1	NP	17	94	80	RL	Nil	3/4	1740	1820
	16/7/18	6	MJ	10.4	63	5	Msb	Nil	0/4	2234	2305
C1-rn	4/7/18	8	MJ	16.5	99	0	Nil	Nil	3/4	2235	2305
	16/7/18	5	BT	10.4	63	5	Msb	Nil	0/4	2143	2215
C1-rs	4/7/18	8	NP	16.5	99	0	Nil	Nil	16.5	2235	2305
	16/7/18	5	MJ	10.4	63	5	Msb	Nil	0/4	2143	2215
C1-ce	4/7/18	7	MJ	16.5	99	0	Nil	Nil	16.5	2157	2228
	16/7/18	7	MJ	10.4	63	5	Msb	Nil	0/4	2315	2345
C1-cw	4/7/18	7	NP	16.5	99	0	Nil	Nil	16.5	2157	2228
	16/7/18	7	MJ	10.4	63	5	Msb	Nil	0/4	2315	2345

Table A3: Survey effort and weather data for Q3 2018 threatened glider monitoring. ML = wind moves leaves; Msb = wind oves small branches; MLB = wind moves large branches.

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
TabLB-ie	2/9/18	1	GM	16.5	66	1/8	MSB	Nil	3/4	1824	1853
	6/9/18	8	BT	15	92	1/8	Nil	Nil	3/4	2416	2445
TabLB-iw	2/9/18	1	BT	16.5	66	1/8	MSB	Nil	3/4	1824	1853
	6/9/18	8	GM	15	92	1/8	Nil	Nil	3/4	2416	2445
TabNR-rn	2/9/18	1	NP	16.5	66	1/8	MSB	Nil	3/4	1820	1850
	6/9/18	10	NP	14.4	93	1/8	Nil	Nil	3/4	0050	0120
TabNR-rs	2/9/18	2	NP	16.5	66	1/8	MLB	Nil	3/4	1900	1930
	6/9/18	9	NP	14.4	93	1/8	Nil	Nil	3/4	0009	0040
TabVM-ie	2/9/18	2	GM	16.5	66	1/8	MLB	Nil	3/4	1909	1940
	6/9/18	7	BT	15	92	1/8	Nil	Nil	3/4	2327	2358
TabVM-iw	2/9/18	2	BT	16.5	66	1/8	MLB	Nil	3/4	1909	1940
	6/9/18	7	GM	15	92	1/8	Nil	Nil	3/4	2327	2358
TabN-ie	2/9/18	3	GM	16.3	78	1/8	MLB	Nil	3/4	2000	2031
	6/9/18	6	BT	16	90	2/8	Nil	Nil	3/4	2242	2311
TabN-iw	2/9/18	3	BT	16.3	78	1/8	MLB	Nil	3/4	2000	2031
	6/9/18	6	GM	16	90	2/8	Nil	Nil	3/4	2242	2311
TabN-ce	2/9/18	3	NP	16.3	78	1/8	MSB	Nil	3/4	1945	2024
	6/9/18	8	NP	15	92	1/8	Nil	Nil	3/4	2316	2351
TabN-cw	2/9/18	4	NP	16.3	78	1/8	MSB	Nil	3/4	2030	2100
	6/9/18	7	NP	15	92	1/8	Nil	Nil	3/4	2239	2309
TabDD-rn	2/9/18	5	NP	16.2	79	2/8	MSB	LS	3/4	2107	2142
	6/9/18	6	NP	16	90	2/8	Nil	Nil	3/4	2200	2230
TabDD-rs	2/9/18	6	NP	16.2	79	2/8	MSB	LS	3/4	2152	2222
	6/9/18	5	NP	16	90	2/8	Nil	Nil	3/4	2119	2150
TabM-ce	2/9/18	5	GM	16.3	78	1/8	MSB	LS	3/4	2200	2231
	6/9/18	5	BT	17.7	98	3/8	Nil	Nil	3/4	2200	2231
TabM-cw	2/9/18	5	BT	16.3	78	1/8	MSB	LS	3/4	2152	2225
	6/9/18	5	GM	17.7	98	3/8	Nil	Nil	3/4	2200	2231
TabM-ie	2/9/18	6	GM	16.2	79	2/8	MSB	LS	3/4	2152	2225
	6/9/18	4	BT	17.7	98	3/8	Nil	Nil	3/4	2245	2316
TabM-iw	2/9/18	6	BT	16.2	79	2/8	MSB	LS	3/4	2110	2142
	6/9/18	4	GM	17.7	98	3/8	Nil	Nil	3/4	2245	2316
TabS-ie	2/9/18	4	GM	16.2	79	2/8	MSB	LS	3/4	2110	2142
	6/9/18	3	BT	16	90	2/8	Nil	Nil	3/4	2054	2125
TabS-iw	2/9/18	4	BT	16.2	79	2/8	MSB	LS	3/4	2015	2046
	6/9/18	3	GM	16	90	2/8	Nil	Nil	3/4	2054	2125
TabS-ce	2/9/18	8	NP	14.8	91	6/8	MSB	LS	3/4	2333	1203
	6/9/18	4	NP	17.7	98	3/8	Nil	Nil	3/4	2030	2100
TabS-cw	2/9/18	7	NP	14.8	91	6/8	MSB	LS	3/4	2250	2323
	6/9/18	3	NP	17.7	98	3/8	Nil	Nil	3/4	1944	2016
MOR-ie	2/9/18	8	GM	14.8	91	6/8	MSB	LS	3/4	2444	0115
	6/9/18	1	BT	17.9	92	5/8	Nil	Nil	3/4	1826	1857
MOR-iw	2/9/18	9	NP	16.9	74	7/8	MSB	LS	3/4	0014	0044
	6/9/18	2	NP	17.9	92	5/8	Nil	Nil	3/4	1903	1935
MOR-ce	2/9/18	7	GM	16.9	74	7/8	MSB	LS	3/4	2356	2425
	6/9/18	2	BT	17.9	92	5/8	Nil	Nil	3/4	1915	1947
MOR-cw	2/9/18	10	NP	16.9	74	7/8	MSB	LS	3/4	0050	0120
	6/9/18	1	NP	17.9	92	5/8	Nil	Nil	3/4	1824	1855
MOR-rn	2/9/18	8	BT	14.8	91	6/8	MSB	LS	3/4	2444	0115
	6/9/18	1	GM	17.9	92	5/8	Nil	Nil	3/4	1826	1857
MOR-rs	2/9/18	7	BT	16.9	74	7/8	MSB	LS	3/4	2356	2425
	6/9/18	2	GM	17.9	92	5/8	Nil	Nil	3/4	1915	1947
TucN-ce	5/9/18	1	NP	14.8	94	7/8	MSB	HS	3/4	1853	1933
	11/9/18	5	NP	13.8	88	1/8	Nil	Nil	1/4	2150	2220

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
TucN-cw	5/9/18	1	GM	14.8	94	7/8	MSB	HS	3/4	1853	1933
	11/9/18	6	NP	13.8	88	1/8	Nil	Nil	1/4	2225	2255
TucM-ce	5/9/18	2	NP	14.8	94	7/8	MSB	HS	3/4	1950	2025
	11/9/18	4	NP	13.8	88	1/8	Nil	Nil	1/4	2053	2123
TucM-cw	5/9/18	2	GM	14.8	94	7/8	MSB	HS	3/4	1950	2025
	11/9/18	3	NP	13.8	88	1/8	Nil	Nil	1/4	2010	2040
Tuc-r-n	5/9/18	3	GM	13	97	8/8	MSB	HS	3/4	2050	2125
	11/9/18	2	BT	15.6	74	0/8	Nil	Nil	0/4	1902	1934
Tuc-r-s	5/9/18	3	NP	13	97	8/8	MSB	HS	3/4	2050	2125
	11/9/18	1	BT	15.6	74	0/8	Nil	Nil	0/4	1816	1847
TucS-ce	5/9/18	4	NP	13	97	8/8	MSB	HS	3/4	2145	2218
	11/9/18	3	BT	14.6	85	0/8	Nil	Nil	0/4	1949	2020
TucS-cw	5/9/18	4	GM	13	97	8/8	MSB	HS	3/4	2145	2218
	11/9/18	4	BT	14.6	85	0/8	Nil	Nil	0/4	2026	2055
TucN-ie	5/9/18	5	NP	12.5	100	2/8	Nil	Nil	3/4	2240	2315
	11/9/18	5	BT	13.9	86	0/8	Nil	Nil	0/4	2104	2135
TucN-iw	5/9/18	5	GM	12.5	100	2/8	Nil	Nil	3/4	2240	2315
	11/9/18	6	BT	13.9	86	0/8	Nil	Nil	0/4	2142	2213
TucS-ie	5/9/18	6	NP	12.5	100	2/8	Nil	Nil	3/4	2345	0020
	11/9/18	2	NP	17	70	0/8	Nil	Nil	1/4	1910	1940
TucS-iw	5/9/18	6	GM	12.5	100	2/8	Nil	Nil	3/4	2345	0020
	11/9/18	1	NP	17	70	0/8	Nil	Nil	1/4	1820	1859
GN-ce	7/9/18	1	GM	18.9	80	2/8	Msb	Nil	3/4	1828	1900
	12/9/18	5	NP	15.5	83	0/8	Nil	Nil	1/4	2050	2125
GN-cw	7/9/18	1	BT	18.9	80	2/8	Msb	Nil	3/4	1828	1900
	12/9/18	4	NP	15.5	83	0/8	Nil	Nil	1/4	2010	2045
GN-ie	7/9/18	2	GM	18.9	80	2/8	Msb	Nil	3/4	1914	1945
	12/9/18	3	NP	15.5	83	0/8	Nil	Nil	1/4	1935	2005
GN-iw	7/9/18	2	BT	18.9	80	2/8	Msb	Nil	3/4	1914	1945
	12/9/18	2	NP	19.3	67	0/8	MSB	Nil	1/4	1900	1930
GS-ie	7/9/18	3	BT	17.9	80	4/8	MLB	Nil	3/4	2012	2045
	12/9/18	1	NP	19.3	67	0/8	MSB	Nil	1/4	1820	1850
GS-iw	7/9/18	3	GM	17.9	80	4/8	MLB	Nil	3/4	2012	2045
	12/9/18	1	BT	19.7	65	1/8	Msb	Nil	0/4	1815	1845
GS-ce	7/9/18	4	NP	17.9	80	4/8	MLB	Nil	3/4	2042	2112
	12/9/18	2	BT	19.7	65	1/8	Msb	Nil	0/4	1903	1935
GS-cw	7/9/18	3	NP	17.9	80	4/8	MLB	Nil	3/4	1955	2030
	12/9/18	5	BT	15.2	85	1/8	Nil	Nil	0/4	2114	2140
G-r-n	7/9/18	1	NP	18.9	80	2/8	Msb	Nil	3/4	1823	1855
	12/9/18	4	BT	15.9	81	1/8	Nil	Nil	0/4	2028	2100
G-r-s	7/9/18	2	NP	18.9	80	2/8	Msb	Nil	3/4	1906	1937
	12/9/18	3	BT	15.9	81	1/8	Nil	Nil	0/4	1951	2020
S3/M2-ce	7/9/18	4	BT	17.9	80	4/8	MLB	Nil	3/4	2215	2246
	12/9/18	6	NP	15.3	88	0/8	Nil	Nil	1/4	2150	2220
S3/M2-cw	7/9/18	4	GM	17.9	80	4/8	MLB	Nil	3/4	2215	2246
	12/9/18	7	NP	15.3	88	0/8	Nil	Nil	1/4	2225	2255
S3/M2-re	10/9/18	2	BT	18.2	68	0/8	Msb	Nil	0/4	1922	1951
	12/9/18	8	NP	14.5	90	0/8	Nil	Nil	1/4	2315	2345
S3/M2-rw	10/9/18	1	BT	18.2	68	0/8	Msb	Nil	0/4	1840	1911
	12/9/18	9	NP	14.5	90	0/8	Nil	Nil	1/4	2358	0030
S3-ie	7/9/18	5	BT	16.4	86	6/8	Nil	Nil	3/4	2305	2338
	13/9/18	8	NP	16.1	92	6/8	Nil	Nil	1/4	2306	2336
S3-iw	7/9/18	5	GM	16.4	86	6/8	Nil	Nil	3/4	2305	2338
	13/9/18	9	NP	16.1	92	6/8	Nil	Nil	1/4	2340	0010
M2-i	7/9/18	5	NP	16.4	86	6/8	Nil	Nil	3/4	2215	2250
	12/9/18	6	BT	15.2	85	1/8	Nil	Nil	0/4	2157	2229
C3-re	7/9/18	6	NP	15	86	2/8	Nil	HS	3/4	2300	2330

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
	12/9/18	7	BT	14.8	90	1/8	Msb	Nil	0/4	2247	2318
C3-rw	10/9/18	1	NP	16.7	74	0/8	Nil	Nil	1/4	1837	1907
	13/9/18	10	NP/BT	14.9	96	6/8	Nil	Nil	1/4	0030	0050
C3-ce	10/9/18	2	NP	16.7	74	0/8	Nil	Nil	1/4	1916	1946
	12/9/18	8	BT	14.8	90	1/8	Msb	Nil	0/4	2329	2400
C3-cw	10/9/18	3	NP	16.7	74	0/8	Nil	Nil	1/4	1953	2023
	12/9/18	9	BT	14.8	90	1/8	Msb	Nil	0/4	2409	2440
C3-ie	10/9/18	3	BT	16	75	0/8	Msb	Nil	0/4	2008	2040
	13/9/18	7	NP	16.3	91	7/8	Nil	Nil	1/4	2215	2245
C3-iw	10/9/18	4	BT	16	75	0/8	Msb	Nil	0/4	2050	2119
	13/9/18	6	NP	16.3	91	7/8	Nil	Nil	1/4	2136	2206
C2-c	10/9/18	4	NP	15	83	0/8	Nil	Nil	1/4	2037	2107
	13/9/18	9	BT	15.5	95	4/8	Nil	Nil	0/4	2401	2430
C2-rn	10/9/18	5	NP	15	83	0/8	RL	Nil	1/4	2119	2150
	13/9/18	7	BT	18	81	4/8	Nil	Nil	0/4	2231	2302
C2-rs	10/9/18	6	NP	15.2	77	0/8	MSB	Nil	1/4	2202	2232
	13/9/18	8	BT	15.5	95	4/8	Nil	Nil	0/4	2315	2346
C2-ie	10/9/18	5	BT	15.6	74	0/8	Msb	Nil	0/4	2127	2158
	13/9/18	5	NP	19.2	80	6/8	RL	Nil	1/4	2055	2125
C2-iw	10/9/18	6	BT	15.6	74	0/8	Msb	Nil	0/4	2210	2240
	13/9/18	4	NP	19.2	80	6/8	RL	Nil	1/4	2019	2049
S2/M1-c	10/9/18	7	BT	14.8	77	0/8	Msb	Nil	0/4	2255	2324
	13/9/18	6	BT	18	81	4/8	Nil	Nil	0/4	2145	2214
S2/M1-r	10/9/18	7	NP	15.2	77	0/8	RL	Nil	1/4	2248	2318
	13/9/18	5	BT	19.2	80	6/8	Nil	Nil	0/4	2059	2130
S2-i	10/9/18	8	NP	14.3	77	0/8	RL	Nil	1/4	2335	0007
	13/9/18	4	BT	19.2	80	6/8	Nil	Nil	0/4	2011	2045
M1-i	Ns										
	Ns										
C1-ie	11/9/18	8	NP	14.5	84	0/8	Nil	Nil	1/4	0030	0108
	13/9/18	2	BT	19.3	82	8/8	Nil	Nil	0/4	1851	1923
C1-iw	11/9/18	7	NP	14.5	84	0/8	Nil	Nil	1/4	2350	0020
	13/9/18	1	BT	19.3	82	8/8	Nil	Nil	0/4	1811	1840
C1-rn	11/9/18	8	BT	13.5	89	0/8	Nil	Nil	0/4	2405	2436
	13/9/18	2	NP	19.6	82	6/8	Msb	Nil	1/4	1850	1920
C1-rs	11/9/18	7	BT	13.5	89	0/8	Nil	Nil	0/4	2322	2351
	13/9/18	1	NP	19.6	82	6/8	Msb	Nil	1/4	1815	1845
C1-ce	10/9/18	8	BT	14.8	77	0/8	Msb	Nil	0/4	2339	2410
	13/9/18	3	BT	19.3	82	8/8	Nil	Nil	0/4	1930	2001
C1-cw	10/9/18	9	BT	14.8	77	0/8	Msb	Nil	0/4	2419	2450
	13/9/18	3	NP	19.6	82	6/8	Msb	Nil	1/4	1931	2001

Table A4: Survey effort and weather data for Q4 2018 construction phase threatened glider monitoring.

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
TabLB-ie	10/12/18	6	GM	21.2	98	0/8	STILL	Nil	0/4	2400	2430
	29/1/19	2	Np						0/4	2112	2142
TabLB-iw	10/12/18	5	GM	21.9	98	1/8	STILL	Nil	0/4	2323	2355
	29/1/19	2	NM						0/4	2112	2142
TabNR-rn	10/12/18	7	GM	21.2	98	0/8	STILL	Nil	0/4	2435	110
	29/1/19	1	NM						0/4	2027	2057
TabNR-rs	10/12/18	8	GM	21.2	98	0/8	STILL	Nil	0/4	120	200
	29/1/19	1	NP						0/4	2027	2057
TabVM-ie	10/12/18	8	NP	21.2	98	0/8	STILL	Nil	0/4	105	135
	29/1/19	3	NM						0/4	2200	2230
TabVM-iw	10/12/18	7	NP	21.2	98	0/8	STILL	Nil	0/4	30	100
	29/1/19	3	NP						0/4	2200	2230
TabN-ie	10/12/18	6	NP	21.2	98	0/8	STILL	Nil	0/4	2345	20
	29/1/19	4	NM						0/4	2240	2310
TabN-iw	10/12/18	5	NP	21.9	98	1/8	STILL	Nil	0/4	2310	2340
	29/1/19	4	NP						0/4	2240	2310
TabN-ce	10/12/18	3	GM	22.2	94	1/8	STILL	Nil	0/4	2154	2230
	29/1/19	5	NP						0/4	2330	1200
TabN-cw	10/12/18	4	GM	21.9	98	1/8	STILL	Nil	0/4	2315	2345
	29/1/19	5	NM						0/4	2330	1200
TabDD-rn	Ns										
	Ns										
TabDD-rs	Ns										
	Ns										
TabM-ce	10/12/18	4	NP	21.9	98	1/8	STILL	Nil	0/4	2300	2330
	29/1/19								0/4		
TabM-cw	10/12/18	3	NP	22.2	94	1/8	STILL	Nil	0/4	2145	2215
	29/1/19								0/4		
TabM-ie	10/12/18	1	GM	22.7	90	1/8	ML	Nil	0/4	2030	2105
	29/1/19								0/4		
TabM-iw	10/12/18	2	GM	21.9	98	1/8	STILL	Nil	0/4	2110	2145
	29/1/19								0/4		
TabS-ie	10/12/18	2	NP	21.9	98	1/8	STILL	Nil	0/4	2101	2131
	29/1/19								0/4		
TabS-iw	10/12/18	1	NP	22.7	90	1/8	ML	Nil	0/4	2030	2100
	29/1/19								0/4		
TabS-ce	10/12/18	7	BT	21.2	98	0/8	STILL	Nil	0/4	2443	115
	29/1/19	7	BT	22.8	98	1/8	Still	Nil	0/4	2448	0118
TabS-cw	10/12/18	8	BT	21.2	98	0/8	STILL	Nil	0/4	157	226
	29/1/19	8	BT	22.8	98	1/8	Still	Nil	0/4	0129	0159
MOR-ie	10/12/18	3	BT	22.2	94	1/8	STILL	Nil	0/4	2213	2243
	29/1/19	3	BT	23.8	93	1/8	MSB	Nil	0/4	2152	2223
MOR-iw	10/12/18	6	BT	21.2	98	0/8	STILL	Nil	0/4	2430	2459
	29/1/19	6	BT	22.8	98	1/8	ML	Nil	0/4	2407	2437
MOR-ce	10/12/18	2	BT	22.2	94	1/8	STILL	Nil	0/4	2129	2200
	29/1/19	2	BT	23.9	91	3/8	MLB	Nil	0/4	2105	2135
MOR-cw	10/12/18	5	BT	21.9	98	1/8	STILL	Nil	0/4	2348	2420
	29/1/19	5	BT	22.8	98	1/8	ML	Nil	0/4	2322	2352
MOR-rn	10/12/18	4	BT	21.9	98	1/8	STILL	Nil	0/4	2257	2328
	29/1/19	4	BT	23.8	93	1/8	ML	Nil	0/4	2238	2309
MOR-rs	10/12/18	1	BT	22.7	90	1/8	ML	Nil	0/4	2035	2106
	29/1/19	1	BT	24.2	87	3/8	MLB	Nil	0/4	2024	2054
TucN-ce	10/12/18	4	NP	21.9	98	1/8	STILL	Nil	0/4	2300	2330
	29/1/19	8	NM						0/4	0130	0200
TucN-cw	10/12/18	3	NP	22.2	94	1/8	STILL	Nil	0/4	2145	2215
	29/1/19	8	NP						0/4	0130	0200
TucM-ce	10/12/18	1	GM	22.7	90	1/8	ML	Nil	0/4	2030	2105
	29/1/19	7	NM						0/4	0050	0120
TucM-cw	10/12/18	2	GM	21.9	98	1/8	STILL	Nil	0/4	2110	2145
	29/1/19	7	NP						0/4	0050	0120
Tuc-r-n	10/12/18	2	NP	21.9	98	1/8	STILL	Nil	0/4	2101	2131
	29/1/19	6	NM						0/4	1210	1240
Tuc-r-s	10/12/18	1	NP	22.7	90	1/8	ML	Nil	0/4	2030	2100

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
	29/1/19	6	NP						0/4	1210	1240
TucS-ce	11/12/18	3	GM	22.2	98	6/8	Still	Nil	0/4	2159	2234
	30/1/19	6	BT	23	81	7/8	ML	Nil	0/4	1245	0115
TucS-cw	11/12/18	4	GM	22.2	98	6/8	Still	Nil	0/4	2237	2310
	30/1/19	6	NM	23	81	7/8	ML	Nil	0/4	1245	0115
TucN-ie	11/12/18	3	NP	22.2	98	6/8	Still	Nil	0/4	2145	2215
	30/1/19	5	BT	23	81	7/8	ML	Nil	0/4	1200	1230
TucN-iw	11/12/18	4	NP	22.2	98	6/8	Still	Nil	0/4	2216	2247
	30/1/19	5	NM	23	81	7/8	ML	Nil	0/4	1200	1230
TucS-ie	11/12/18	3	BT	22.2	98	6/8	Still	Nil	0/4	2142	2211
	30/1/19		NP						0/4		
TucS-iw	11/12/18	4	BT	22.2	98	6/8	Still	Nil	0/4	2221	2252
	30/1/19		NP						0/4		
GN-ce	11/12/18	5	GM	20.7	99	7/8	ML	Nil	0/4	2349	0022
	30/1/19	4	BT	23.9	79	7/8	ML	Nil	0/4	1102	1132
GN-cw	11/12/18	6	GM	20.7	99	7/8	ML	Nil	0/4	0023	0052
	30/1/19	4	NM	23.9	79	7/8	ML	Nil	0/4	1102	1132
GN-ie	11/12/18	7	GM	20.7	99	7/8	ML	Nil	0/4	0057	0127
	30/1/19	3	BT	23.9	79	7/8	ML	Nil	0/4	2220	2252
GN-iw	11/12/18	8	GM	20.7	99	7/8	ML	Nil	0/4	0132	208
	30/1/19	3	NM	23.9	79	7/8	ML	Nil	0/4	2220	2252
GS-ie	11/12/18	6	BT	20.7	99	7/8	ML	Nil	0/4	2435	2455
	30/1/19	2	BT	26	64	8/8	MLB	Nil	0/4	2126	2157
GS-iw	11/12/18	5	BT	20.7	99	7/8	ML	Nil	0/4	2335	2415
	30/1/19	2	NM	26	64	8/8	MLB	Nil	0/4	2126	2157
GS-ce	11/12/18	7	NP	20.7	99	7/8	ML	Nil	0/4	0045	0118
	30/1/19	3	NP							2153	2223
GS-cw	11/12/18	8	NP	20.7	99	7/8	ML	Nil	0/4	0125	0200
	30/1/19	4	NP							2230	2300
G-r-n	11/12/18	6	NP	20.7	99	7/8	ML	Nil	0/4	0000	0030
	30/1/19	2	NP							2103	2133
G-r-s	11/12/18	5	NP	20.7	99	7/8	ML	Nil	0/4	2320	2350
	30/1/19	1	NP							2024	2054
S3/M2-ce	11/12/18	7	BT	20.7	99	7/8	ML	Nil	0/4	115	146
	30/1/19	1	NM	26	64	8/8	MLB	Nil	0/4	2020	2052
S3/M2-cw	12/12/18	7	NP	22	78	3/8	ML	Nil	0/4	0100	0130
	30/1/19	1	BT	26	64	8/8	MLB	Nil	0/4	2020	2052
S3/M2-re	12/12/18	5	BT	22	78	3/8	ML	Nil	0/4	2417	2448
	31/1/19	1	NP	25.5	73	2/8	ML	Nil	0/4	2030	2130
S3/M2-rw	12/12/18	5	BB	22	78	3/8	ML	Nil	0/4	2417	2448
	31/1/19	1	NM	25.5	73	2/8	ML	Nil	0/4	2030	2130
S3-ie	12/12/18	6	GM	22	78	3/8	ML	Nil	0/4	022	0102
	31/1/19	2	NM	25.5	73	2/8	ML	Nil	0/4	2045	2115
S3-iw	12/12/18	5	GM	22	78	3/8	ML	Nil	0/4	2339	0014
	31/1/19	2	NP	25.5	73	2/8	ML	Nil	0/4	2045	2115
M2-i	12/12/18	6	NP	22	78	3/8	ML	Nil	0/4	0020	0050
	31/1/19	5	BT						0/4	2328	2400
C3-re	12/12/18	5	NP	22	78	3/8	ML	Nil	0/4	2337	0007
	31/1/19	6	BT						0/4	2410	2441
C3-rw	12/12/18	7	GM	22	78	3/8	ML	Nil	0/4	0113	0147
	31/1/19	4	BT						0/4	2239	2310
C3-ce	12/12/18	6	BB	22	78	3/8	ML	Nil	0/4	0110	0140
	31/1/19	3	NM	24.4	78	2/8	Nil	Nil	0/4	2200	2230
C3-cw	12/12/18	6	BT	22	78	3/8	ML	Nil	0/4	0110	0140
	31/1/19	3	NP	24.4	78	2/8	Nil	Nil	0/4	2200	2230
C3-ie	12/12/18	4	BT	21	79	7/8	ML	Nil	0/4	2320	2350
	31/1/19	4	NM	24.4	78	2/8	Nil	Nil	0/4	2245	2315
C3-iw	12/12/18	4	BB	21	79	7/8	ML	Nil	0/4	2320	2350
	31/1/19	4	NP	24.4	78	2/8	Nil	Nil	0/4	2245	2315
C2-c	12/12/18	4	GM	21	79	7/8	ML	Nil	0/4	2242	2320
	31/1/19	3	BT						0/4	2155	2226
C2-rn	12/12/18	4	NP	21	79	7/8	ML	Nil	0/4	2245	2315
	31/1/19	7	BT						0/4	2456	0125
C2-rs	12/12/18	3	NP	22	88	4/8	ML	Nil	0/4	2200	2230
	31/1/19	8	BT						0/4	0135	0205

Transect	Date	Order	Observer	Temp	Humidity	Cloud %	Wind	Rain	Moon	Start	Finish
C2-ie	12/12/18	3	BB	22	88	4/8	ML	Nil	0/4	2220	2250
	31/1/19	5	NM	23	87	2/8	Nil	Nil	0/4	2330	0000
C2-iw	12/12/18	3	BT	22	88	4/8	ML	Nil	0/4	2220	2250
	31/1/19	5	NP	23	87	2/8	Nil	Nil	0/4	2330	0000
S2/M1-c	12/12/18	3	GM	22	88	4/8	ML	Nil	0/4	2145	2230
	31/1/19	9	BT						0/4	0217	0247
S2/M1-r	12/12/18	2	NP	22.5	80	8/8	ML	Nil	0/4	2109	2140
	31/1/19	2	BT						0/4	2105	2135
S2-i	12/12/18	1	NP	22.5	80	8/8	ML	Drizzle	0/4	2020	2057
	31/1/19	1	BT						0/4	2019	2052
M1-i	ns										
	ns										
C1-ie	12/12/18	2	GM	22.5	80	8/8	ML	Nil	0/4	2100	2135
	31/1/19	8	NM	24.1	77	2/8	Nil	Nil	0/4	0150	0220
C1-iw	12/12/18	1	GM	22.5	80	8/8	ML	Drizzle	0/4	2022	2055
	31/1/19	8	NP	24.1	77	2/8	Nil	Nil	0/4	0150	0220
C1-rn	12/12/18	1	BB	22.5	80	8/8	ML	Drizzle	0/4	2033	2102
	31/1/19	7	NM	24.1	77	2/8	Nil	Nil	0/4	0110	0140
C1-rs	12/12/18	1	BT	22.5	80	8/8	ML	Drizzle	0/4	2033	2102
	31/1/19	7	NP	24.1	77	2/8	Nil	Nil	0/4	0110	0140
C1-ce	12/12/18	2	BB	22.5	80	8/8	ML	Nil	0/4	2122	2152
	31/1/19	6	NM	24.1	77	2/8	Nil	Nil	0/4	1220	1250
C1-cw	12/12/18	2	BT	22.5	80	8/8	ML	Nil	0/4	2122	2152
	31/1/19	6	NP	24.1	77	2/8	Nil	Nil	0/4	1220	1250

Appendix B – Population survey detections

Table B1: Results of Q1 2018 spotlighting and call playback surveys. YbG = yellow-bellied glider; SqG = squirrel glider; SuG = sugar glider; GG = greater glider; FtG = Feathertail Glider; CBP = common brushtail possum; SeBP = short-eared brushtail possum; CRP = common ringtail possum; PO = powerful owl; MO = masked owl; BB = boobook owl; ON = owlet nightjar; WtN = white-throated nightjar; TF = tawny frogmouth; GhFF = grey-headed flying fox; LRFF = little red flying fox. HM = heard movement, HC = heard call; HL = heard glide-land on tree; SE = saw eyeshine; SG = saw glide; SM = saw movement.

Transect	Date	Fauna	Flowering
TabLB-ie	12/2/18	SqG.SE@500E2S,	BB, R Bloodwood
	14/2/18	CBtP SE@250E20N, CRtP x 2. SE@350e25s	
TabLB-iw	12/2/18	GG.SE@350N10W	
	14/2/18	FtG1 SM@250N5W, FtG2.SM@500N15W, GG.SE@500N10W	
TabNR-rn	12/2/18	BO.SM@5W10N, OnJ	Scribbly, Red Bloodwood
	14/2/18	SqG.SE@100E2N	Single Mel. quin
TabNR-rs	12/2/18	OnJ	Red Bloodwood
	14/2/18	OnJ, TF, BO.HC@1S30E	
TabVM-ie	12/2/18	FtG.150S1E, GG.SE20S50W	
	14/2/18	SuG.HC@100mS20e GG.SE@250s10e	
TabVM-iw	12/2/18	Nil	
	14/2/18	Nil	
TabN-ie	12/2/18	Nil	
	14/2/18	OnJ	
TabN-iw	12/2/18	FtG.SM250s5W	
	14/2/18	OnJ	
TabN-ce	12/2/18	Nil	
	14/2/18	Nil	
TabN-cw	12/2/18	SqG.SE@350s50w	Bb
	14/2/18	GG.SE@380S6E	
TabDD-rn	12/2/18	Nil	
	14/2/18	SuG.SE500n10w, OnJ	
TabDD-rs	12/2/18	SqG.SE@40s5e, GG.SE@120s50e	Bb
	14/2/18	OnJ, GG.SE@200S70W	
TabM-ce	13/2/18	OnJ	
	15/2/18	Nil	
TabM-cw	13/2/18	Nil	
	15/2/18	GG.SE@50S35W, CBtP.SE@400S15W, OnJ	Nil
TabM-ie	13/2/18	Nil	
	15/2/18	SqG.SE@75N5W	
TabM-iw	13/2/18	FtG.SM@100N5W, OnJ	
	15/2/18	Nil	
TabS-ie	13/2/18	Nil	
	15/2/18	Nil	
TabS-iw	13/2/18	SqG.SE@450N15E	
	15/2/18	WtNJ	
TabS-ce	13/2/18	Nil	
	15/2/18	CBtP.SE@50mN5e	
TabS-cw	13/2/18	Nil	
	15/2/18	Nil	
MOR-ie	13/2/18	OnJ	
	15/2/18	SuG.SE@250s10e, CRtP.SE@400s10w, OnJ	
MOR-iw	13/2/18	CRtP.SE@50S5E	
	15/2/18	CBtP.SE@5S5W, GG.SE@25S10w, BO.HC350s100e, OnJ	
MOR-ce	13/2/18	YbG.HC280N10W(>pb), FtG1.SM@340N4E FtG2.SM@500N5E	
	15/2/18	SuG/SqG.SE@100s20e	
MOR-cw	13/2/18	SuG.SM@400n2w, GHFF	
	15/2/18	Nil	

Transect	Date	Fauna	Flowering
MOR-rn	13/2/18	SqG.HC@400S0W, SuG.SE@300S15W	Nil
	15/2/18	SuG.HC@10S20E, SuG2.HC@250S30W, OnJ, Noisy Pitta	
MOR-rs	13/2/18	SuG.HC@200N30E, WtNJ	1 spotted Gum
	15/2/18	SuG1.HC@10n20w, SuG2.HC10n10E, SuG3.HC@250n20w, SuG4.HC@450n15w	
TucN-ce	19/2/18	CBtP1.SE@120n5e, FtG.SM@130n5w, PO.HC@100n70e, CBtP2.SE@490n35e, OnJ, GHFF	
	21/2/18	PO.HC@0n80e, OnJ, CBtP.SE@100n2e, TF	
TucN-cw	19/2/18	BO/MO.HC@500n20w	
	21/2/18	CBtP.SE@90n20e, SqG.HM@250n10e, TF,	
TucM-ce	19/2/18	PO.HC@50s100w. CBtP.SE@60s20w	
	21/2/18	OnJ	
TucM-cw	19/2/18	CBtP.SE@10s5w, CBtP2.SE@250s5w	
	21/2/18	OnJ	
Tuc-r-n	19/2/18	SqG.HC@350n20e	
	21/2/18	BTPhas.HM@20n2e, SqG1.HC@20n20w, BO.HC@400n60e, SqG2.HC@-50n20e	
Tuc-r-s	19/2/18	SqG1.HC@200e40n, CBtP.SE@350e50n, SqG2.SE@450e2n, SqG3..HM@470e5n, SqG4.HC@500e30s, OnJ, FtG.SM@470e5n	R. Bloodwood
	21/2/18	OnJ	
TucS-ce	19/2/18	CRtP.SE@200s20w, OnJ	R. Bloodwood
	21/2/18	SuG.HC@150n20e, TFx2	
TucS-cw	19/2/18	SqGx2.HC@250s10e, OnJ	
	21/2/18	CRtP.SE@100s30e	
TucN-ie	19/2/18	GG1.SE@120s20e, GG2.SE@350s20e, GG3.SE@420s5w, SqG1.HC@360s10e, SqG2.HC@550s10e	
	21/2/18	SqG.HC@250S20e,	
TucN-iw	19/2/18	OnJ	
	21/2/18	SuG.SE.200s10w	
TucS-ie	22/2/18	GG1.SE@200s10e, GG2.SE@230s12e, SqG.HC@470s10w, Noisy Ptta, OnJ	Scribbly Gum x 1
	28/2/18	GG1.SE@5s30e, GG2.SE@100s30e, GG3.SE@300s30e	
TucS-iw	22/2/18	GG.SE@0s20w, SuG.SE@100s10w, BO.HC@250s30w	
	22/2/18	Prob petaurid SE@530s5w retreated to hollow	Scribbly gum
GN-ce	22/2/18	SqG.SE@300s5w, OnJ	Nil
	28/2/18	Nil	Spotted gum
GN-cw	22/2/18	GG1.SE@350s120w, GG2.SE@400s10w, LRFF	Nil
	28/2/18	Nil	Spotted gum
GN-ie	22/2/18	GG1.SE@300s20e, GG2.SE@400s10e, TF, LRFF	Nil
	28/2/12	YBG1 HC@2s40me, YBG2 HC@500s50e	
GN-iw	22/2/18	GG.SE@70s30w, LRFF	Nil
	28/2/18	Nil	
GS-ie	Ns		
	Ns		
GS-iw	Ns		
	Ns		
GS-ce	22/2/18	LRFF, GHFF	Blackbutt
	28/2/18	Nil	
GS-cw	22/2/18	GHFF, LRFF, CBtP.SE@300n30w, CBtP.SE@450n20e	Blackbutt
	28/2/18	Nil	Blackbutt
G-r-n	22/2/18	Nil	Nil
	28/2/18	OnJ, TF	
G-r-s	22/2/18	Nil	Nil
	28/2/18	OnJ	Nil
S3/M2-ce	27/2/18	Nil	Nil
	1/3/18	Nil	
S3/M2-cw	27/2/18	Nil	Nil
	1/3/18	Nil	
S3/M2-re	27/2/18	Nil	Nil

Transect	Date	Fauna	Flowering
	1/3/18	BSC (pair) SM@450s1e	
S3/M2-rw	27/2/18	Nil	Nil
	1/3/18	Nil	
S3-ie	27/2/18	Nil	Nil
	1/3/18	Nil	
S3-iw	27/2/18	TF	Nil
	1/3/18	Nil	Spotted gum
M2-i	27/2/18	Nil	Nil
	1/3/18	YbG.HC@110s100e >pb	
C3-re	27/2/18	OnJ	Nil
	1/3/18	YbG.HC@60e70s >pb, CBtPx2.SE@340e15s	
C3-rw	27/2/18	YbG1.HC@80s45e, YbG2.HC@350s50w (both >pb) BO.HC@130s40e, OnJ, WtNj	Nil
	1/3/18	YbG.HC@420s90e >pb, OnJ	
C3-ce	27/2/18	Nil	Nil
	1/3/18	Nil	
C3-cw	27/2/18	Nil	Nil
	1/3/18	OnJ	
C3-ie	27/2/18	Nil	Nil
	1/3/18	Nil	
C3-iw	27/2/18	CBtP.SE@350s10e	Nil
	1/3/18	GHFF	
C2-c	27/2/18	GHFF	Nil
	1/3/18	Nil	
C2-rn	27/2/18	Nil	Nil
	1/3/18	Nil	
C2-rs	27/2/18	GG.SE@200s10e	Nil
	1/3/18	YBG.SE@500s30w	
C2-ie	28/2/18	OnJ	Nil
	2/3/18	OnJ	
C2-iw	28/2/18	SBbk.HC@50s40w	Nil
	2/3/18	Nil	
S2/M1-c	27/2/18	Nil	Nil
	1/3/18	Nil	
S2/M1-r	28/2/18	YbG.HC@400e80n (>pb, 2023), WtNj, OnJ, TF	Nil
	2/3/18	GHFF	
S2-i	27/2/18	CBtP1.SE@180s10w, CBtP2.SE@185s5w, GG.SE@380s5w	Nil
	1/3/18	Nil	
M1-i	Ns		
	ns		
C1-ie	28/2/18	CBtP.HM@230n5w	Nil
	2/3/18	CBtP.SE@250n50e	
C1-iw	28/2/18	Nil	Nil
	2/3/18	Nil	
C1-rn	28/2/18	SqG.SE@495n1e, WtNj	Nil
	2/3/18	SuG.HC@130n45w, TF, OnJ	
C1-rs	28/2/18	GHFF, OnJ	2 x White Stringybark
	2/3/18	Nil	
C1-ce	28/2/18	SuG.SE@130n17e, OnJ	Nil
	2/3/18	OnJ	
C1-cw	28/2/18	FtG.SG@30n3e	Nil
	2/3/18	CBtP.SE@250n2e	

Table B2: Results of Q2 2018 spotlighting and call playback surveys. YbG = yellow-bellied glider; SqG = squirrel glider; SuG = sugar glider; GG = greater glider; FtG = Feathertail Glider; CBP = common brushtail possum; SeBP = short-eared brushtail possum; CRP = common ringtail possum; PO = powerful owl; MO = masked owl; BB = boobook owl; ON = owlet nightjar; WtN = white-throated nightjar; TF = tawny frogmouth; GhFF = grey-headed flying fox; LRFF = little red flying fox. HM = heard movement, HC = heard call; HL = heard glide-land on tree; SE = saw eyeshine; SG = saw glide; SM = saw movement. Easting/Northing = centre point of transect.

Transect	Date	Fauna	Flowering
TabLB-ie	12/6/18	CRtPx1. HM@310n30e	Nil
	14/6/18	CRtPx1. HC@450n7e	
TabLB-iw	12/6/18	Nil	Nil
	14/6/18	Nil	
TabNR-rn	12/6/18	Nil	Nil
	14/6/18	TF, SqG.HC@230e20n	
TabNR-rs	12/6/18	Nil	Nil
	14/6/18	GG.SE@100s25e, SqG.HC@120s20w	Melaleuca
TabVM-ie	12/6/18	TF	Nil
	14/6/18	TF, GG.SE@250s30w	
TabVM-iw	12/6/18	FtG.SE@350ss1w	Nil
	14/6/18	Nil	
TabN-ie	12/6/18	Nil	Nil
	14/6/18	TF	
TabN-iw	12/6/18	Nil	Nil
	14/6/18	Nil	Melaleuca
TabN-ce	12/6/18	Nil	Nil
	14/6/18	Nil	
TabN-cw	12/6/18	SuG.SE@200s17e	W.Stringybark x1
	14/6/18	TF	
TabDD-rn	12/6/18	Nil	Nil
	14/6/18	SqGx2.SE@450n20w, BO.HC@280n100e	Blackbutt x1
TabDD-rs	12/6/18	SuG.SE@10s15e, GG.SE@280s12e	Spotted Gum x 2
	14/6/18	TF, SuGx2, SuG1.HC@100s30w, SuG2.SM@250s2e	
TabM-ce	13/6/18	Nil	Nil
	15/6/18	Nil	
TabM-cw	13/6/18	YbG.HC@500s80e (>pb)	Nil
	15/6/18	CBtP.HM@50s60w	
TabM-ie	13/6/18	Nil	Nil
	15/6/18	Nil	
TabM-iw	13/6/18	GG.SE@420n45w	Stringybark x 2
	15/6/18	SuGx2. SuG1.SE@150n10w, SuG2.SE@470n10w	
TabS-ie	12/6/18	Nil	Wattle
	14/6/18	Nil	
TabS-iw	12/6/18	FtG.HM@380n5w, SuG.HC@500n90w	Nil
	14/6/18	Nil	
TabS-ce	13/6/18	Nil	
	15/6/18	Nil	
TabS-cw	13/6/17	GHFF	FRG, Ironbark
	15/6/18	YbG.HC@10e10s, GHFF	
MOR-ie	13/6/18	Nil	Nil
	15/6/18	SqG.SE@300n10e, FtG.SM@0n1w	
MOR-iw	13/6/18	Nil	Nil
	15/6/18	Nil	
MOR-ce	13/6/18	SuG.SM@350n2e	Nil
	15/6/18	FtG.SG@480n5w, CRtP.SE@520n10e	
MOR-cw	13/6/18	Nil	Nil
	15/6/18	Nil	
MOR-rn	13/6/18	TF	Nil
	15/6/18	Nil	
MOR-rs	13/6/18	GG.SE@250n5e	Nil
	15/6/18	YBGx2. YBG1.HC@0n30e (during pb) YBG2.SE@50n2e (>pb)	
TucN-ce	18/6/18	BO.HC@10n50e	Tallowwood, Banksia
	20/6/18	PO.HC@0e100s, TFx2	
TucN-cw	18/6/18	CBtP.SE@80n5e, GHFF	Ironbark x 1, Banksia
	20/6/18	GHFF	
TucM-ce	18/6/18	Nil	Tallowwood, Ironbark
	20/6/18	CBtPx2, CBtP1.SE@300n30w, CBtP2.SE@400n30w, GHFF	

Transect	Date	Fauna	Flowering
TucM-cw	18/6/18	GHFF	Swamp Mahogany remnants, banksia
	20/6/18	CBtP.HC@500s50w, GHFF	
Tuc-r-n	18/6/18	Nil	Nil
	20/6/18	Nil	
Tuc-r-s	18/6/18	Nil	Nil
	20/6/18	SuG.HC@400e60n	
TucS-ce	18/6/18	Nil	Banksia
	20/6/18	CRtP.SE@380s10e, TF	
TucS-cw	18/6/18	Nil	Banksia
	20/6/18	SuG.HC@5s50w	
TucN-ie	18/6/18	OnJ	Banksia
	20/6/18	Nil	
TucN-iw	18/6/18	Nil	
	20/6/18	GHFF	
TucS-ie	18/6/18	GG.SE@200s75e, SqG.HC@500s10e	Tallowwood, Banksia
	20/6/18	GG.SE@400n45e	
TucS-iw	18/6/18	YBG.HC@-50s50w (<50pb), GG.SE@100s15w, SuG.SE@300s30w, SqG.HC@550s10e, TF	Tallowwood, Banksia
	20/6/18	SqGx2.HC@350n150w&200w	
GN-ce	19/6/18	Nil	
	21/6/18	Nil	
GN-cw	19/6/18	GG.SE@80s10e	Nil
	21/6/18	Nil	
GN-ie	19/6/18	Nil	Spotted Gum
	21/6/18	Nil	
GN-iw	19/6/18	Nil	Nil
	21/6/18	GG.SE@325s15w	
GS-ie	19/6/18	Nil	Nil
	16/7/18	SqG.se400s10e	Spotted Gum
GS-iw	19/6/18	Nil	
	16/7/18	Nil	Spotted Gum
GS-ce	19/6/18	Nil	Ironbark
	21/6/18	Nil	
GS-cw	19/6/18	CBtPx2, CBtP1.HM@5n45e, CBtP2.SE@25n50w	Nil
	21/6/18	CBtPx1.SE@50n80e	
G-r-n	19/6/18	BO.HC@50n65w, FF spp.	Nil
	21/6/18	CBtPx2.SE@250n50e	
G-r-s	19/6/18	Nil	Nil
	21/6/18	Nil	
S3/M2-ce	19/6/18	Nil	Ironbark, spotted Gum (few)
	21/6/18	SqG.SM@470n20e	
S3/M2-cw	19/6/18	Nil	Ironbark
	21/6/18	Nil	
S3/M2-re	3/7/18	GG.SE@150s40e	Acacia
S3/M2-rw	3/7/18	SqG.SE@350s20e	Nil
S3-ie	3/7/18	Nil	Ironbark
	16/7/18	Nil	Ironbark
S3-iw	3/7/18	Nil	Ironbark
	16/7/18	GHFF	Ironbark
M2-i	3/7/18	YbG.HC(<pb)@600s80e	Nil
	5/7/18	YbG.HC(>pb)@150n20w	
C3-re	3/7/18	YbGx2. YbG1.HC(<pb)20e5s. YbG2.HC(<pb)@-60m10n, CBtP.@500e10s	Nil
	5/7/18	CBtP.SE@-5e5s, TF	
C3-rw	3/7/18	SqG.HM@430s5w	Nil
	5/7/18	Nil	
C3-ce	3/7/18	Nil	Scribbly Gum, B.integ
	16/7/18	Nil	Scribbly Gum, B.integ
C3-cw	3/7/18	SqG.SE@150s7w	Nil
	16/7/18	Nil	Scribbly Gum, B.integ
C3-ie	3/7/18	MO.SF@150s1w, FtG.SM@5s5e	Banksia int.
	5/7/18	SqG.SE@380s2e	
C3-iw	3/7/18	CRtP.SE@430s5w	Banksia int.
	5/7/18	CBtP.SE@5n20w	
C2-c	3/7/18	TF	Banksia int.

Transect	Date	Fauna	Flowering
	5/7/18	SEBtPx1.SE@240n10w	
C2-rn	4/7/18	Nil	Nil
C2-rs	4/7/18	SuG.HC@490s60e	Nil
C2-ie	4/7/18	SEBtP.SE@200s2w	Nil
	16/7/18	SqG.se350S5w	
C2-iw	4/7/18	Nil	Banksia, Ironbark
	16/7/18	Nil	
S2/M1-c	4/7/18	Nil	Paperbark, one ironbark
S2/M1-r	4/7/18	Nil	Nil
S2-i	4/7/18	SqG.SE@220s5w, FtG.SM@240s40e, GG1.SE@260s15w, GG2.SE@275s40w	Ironbark
M1-i	Ns		
	ns		
C1-ie	4/7/18	Nil	Ironbark, paperbark
	16/7/18	CBP. Se100n15w	
C1-iw	4/7/18	SqG.HM@490s2e	Nil
	16/7/18	Nil	
C1-rn	4/7/18	Nil	Nil
	16/7/18	SqG.HC@400n10w	
C1-rs	4/7/18	Nil	Nil
	16/7/18	Nil	
C1-ce	4/7/18	Nil	FRG x 2
	16/7/18	Nil	
C1-cw	4/7/18	Nil	Nil
	16/7/18	Nil	

Table B3: Results of Q3 2018 spotlighting and call playback surveys. YbG = yellow-bellied glider; SqG = squirrel glider; SuG = sugar glider; GG = greater glider; FtG = Feathertail Glider; CBP = common brushtail possum; SeBP = short-eared brushtail possum; CRP = common ringtail possum; PO = powerful owl; MO = masked owl; BB = boobook owl; ON = owlet nightjar; WtN = white-throated nightjar; TF = tawny frogmouth; GhFF = grey-headed flying fox; LRFF = little red flying fox. HM = heard movement, HC = heard call; HL = heard glide-land on tree; SE = saw eyeshine; SG = saw glide; SM = saw movement. Easting/Northing = centre point of transect.

Transect	Date	Fauna	Flowering
TabLB-ie	2/9/18	TF	Twood
	6/9/18	Nil	
TabLB-iw	2/9/18	GGx2	
	6/9/18	Nil	
TabNR-rn	2/9/18	ONj	Nil
	6/9/18	Nil	
TabNR-rs	2/9/18	Nil	Nil
	6/9/18	MO	
TabVM-ie	2/9/18	GG	Wh Mahog
	6/9/18	SqG, GGx2, BtPhas	
TabVM-iw	2/9/18	FtG	
	6/9/18	Nil	
TabN-ie	2/9/18	Nil	Wh Mahog
	6/9/18	SuG, ONj	Twood
TabN-iw	2/9/18	SuG	Acacias
	6/9/18	Nil	
TabN-ce	2/9/18	Nil	Ironbark, Tallowwood, Stringybark
	6/9/18	MO	
TabN-cw	2/9/18	ONj	Stringybark remnants
	6/9/18	Nil	
TabDD-rn	2/9/18	Nil	Tallowwood
	6/9/18	Nil	
TabDD-rs	2/9/18	Nil	
	6/9/18	GG, SuG	
TabM-ce	2/9/18	Nil	
	6/9/18	Nil	
TabM-cw	2/9/18	SqG	
	6/9/18	GHFF, ONj	
TabM-ie	2/9/18	GHFF, ONj	
	6/9/18	Nil	
TabM-iw	2/9/18	Nil	
	6/9/18	GG	Acacia
TabS-ie	2/9/18	GG	Wh Mahog
	6/9/18	Nil	
TabS-iw	2/9/18	BO, GHFF	
	6/9/18	Nil	
TabS-ce	2/9/18	GHFF	White Mahogany, Ironbark, narrowleaved red gum
	6/9/18	GHFF, ONj, FtG	
TabS-cw	2/9/18	GHFF, ONj	Ironbark
	6/9/18	GHFF	
MOR-ie	2/9/18	Nil	
	6/9/18	SuG	Acacia
MOR-iw	2/9/18	ONj, GHFF	Tallowwood
	6/9/18	SuG, GHFF	
MOR-ce	2/9/18	Nil	
	6/9/18	SuG, ONj, GHFF	wh mahog
MOR-cw	2/9/18	Nil	Tallowwood
	6/9/18	Nil	
MOR-rn	2/9/18	Nil	

Transect	Date	Fauna	Flowering
	6/9/18	Nil	
MOR-rs	2/9/18	YbGx2, ONj	Grey ibk, spot gum
	6/9/18	YbG, ONj, GHFF	
TucN-ce	5/9/18	Nil	White Mahogany, Ironbark, acacia
	11/9/18	Nil	
TucN-cw	5/9/18	Nil	Tallowwood, acacia
	11/9/18	ONj, GHFF	
TucM-ce	5/9/18	BO	Tallowwood
	11/9/18	SuG, CRtPx2, ONj, GHFF	Tallowwood
TucM-cw	5/9/18	Nil	
	11/9/18	SqGx2, GHFF, CBtPx2	
Tuc-r-n	5/9/18	SqG, GHFF, ONj	Ironbark, Tallowwood
	11/9/18	SqG, SuG, GHFF, ONj	
Tuc-r-s	5/9/18	SuG	Talowwood, Ironbark, Acacia
	11/9/18	SqG, WtNj, ONj	
TucS-ce	5/9/18	Nil	Acacia, Tallowwood
	11/9/18	SqG	
TucS-cw	5/9/18	BbO, GHFF, TF, SuG	Ibk
	11/9/18	BbO	
TucN-ie	5/9/18	SqG, BbOx2*	Tallowwood, Ibk
	11/9/18	SqG, CBtP, SeBtP, GHFF	
TucN-iw	5/9/18	SqGx2, GHFF, ONj, BbO	Tallowwood, Ibk
	11/9/18	SqG, GHFF, BbO	
TucS-ie	5/9/18	GGx2	Tallowwood, Acacia
	11/9/18	GG	
TucS-iw	5/9/18	GHFF, GG, SuG	Tallowwood
	11/9/18	YbGx2, OnJ, CBtP, WtNj	
GN-ce	7/9/18	Nil	
	12/9/18	ONj	
GN-cw	7/9/18	Nil	Spot gum, ibk,
	12/9/18	GG, ONj	
GN-ie	7/9/18	TF, BbO	
	12/9/18	Nil	
GN-iw	7/9/18	Nil	
	12/9/18	SqG	Nil
GS-ie	7/9/18	Nil	
	12/9/18	BtPhas	Ironbark
GS-iw	7/9/18	Nil	
	12/9/18	Nil	Spot gum
GS-ce	7/9/18	GHFF, CBtP	Grey Ironbark
	12/9/18	GHFF	Ibk
GS-cw	7/9/18	SuG, FtG, SqG	Grey Ironbark
	12/9/18	Nil	Ibk
G-r-n	7/9/18	ONj	Nil
	12/9/18	Nil	
G-r-s	7/9/18	SqG, GHFF, Rufous Bettong	Grey Ironbark
	12/9/18	CBtP, GHFF, ONj	Ibk
S3/M2-ce	7/9/18	Nil	
	12/9/18	ONj	
S3/M2-cw	7/9/18	FtG, ONj	
	12/9/18	Nil	
S3/M2-re	10/9/18	Nil	
	12/9/18	ONj	
S3/M2-rw	10/9/18	SqGx2	
	12/9/18	SqGx2	
S3-ie	7/9/18	Rufous Bettong	
	13/9/18	Nil	

Transect	Date	Fauna	Flowering
S3-iw	7/9/18	Nil	
	13/9/18	SqG	
M2-i	7/9/18	Nil	Nil
	12/9/18	FtG	
C3-re	7/9/18	Nil	Tallowwood, acacia
	12/9/18	ONj	
C3-rw	10/9/18	ONj	Nil
	13/9/18	ONj	
C3-ce	10/9/18	FtG	Tallowwood remnants, some Scribbly Gum
	12/9/18	Nil	
C3-cw	10/9/18	Nil	Nil
	12/9/18	Nil	
C3-ie	10/9/18	Nil	Acacia
	13/9/18	Nil	
C3-iw	10/9/18	Nil	Acacia
	13/9/18	Nil	
C2-c	10/9/18	SqG	Tallowwood, Banksia integ
	13/9/18	Nil	
C2-rn	10/9/18	YbG	Nil
	13/9/18	Nil	
C2-rs	10/9/18	Nil	Nil
	13/9/18	MO, ONj	
C2-ie	10/9/18	FtG	
	13/9/18	MO	
C2-iw	10/9/18	CRtP	Twood
	13/9/18	Rodent sp.	
S2/M1-c	10/9/18	Nil	Twood
	13/9/18	Nil	
S2/M1-r	10/9/18	YbG, ONj	Nil
	13/9/18	YbG	
S2-i	10/9/18	Nil	Nil
	13/9/18	CBtPx2	
M1-i	Ns		
	ns		
C1-ie	11/9/18	SqG, FtG	FRG
	13/9/18	Nil	F red gum
C1-iw	11/9/18	Nil	
	13/9/18	Nil	
C1-rn	11/9/18	YbG, SqG	
	13/9/18	Nil	
C1-rs	11/9/18	ONj, SuG	
	13/9/18	Nil	
C1-ce	10/9/18	SuGx3	F red gum
	13/9/18	SuG	
C1-cw	10/9/18	SuG	
	13/9/18	CBtPx2	

Table B4: Results of Q4 2018 spotlighting and call playback surveys. YbG = yellow-bellied glider; SqG = squirrel glider; SuG = sugar glider; GG = greater glider; FtG = Feathertail Glider; CBP = common brushtail possum; SeBP = short-eared brushtail possum; CRP = common ringtail possum; PO = powerful owl; MO = masked owl; BB = boobook owl; ON = owlet nightjar; WtN = white-throated nightjar; TF = tawny frogmouth; GhFF = grey-headed flying fox; LRFF = little red flying fox. HM = heard movement, HC = heard call; HL = heard glide-land on tree; SE = saw eyeshine; SG = saw glide; SM = saw movement. Easting/Northing = centre point of transect.

Transect	Date	Fauna	Flowering
TabLB-ie	10/12/18	Nil	Scribblygum
	29/1/19	SqG.SM@340e10s, CRtP.SE@150e20s	Blackbutt
TabLB-iw	10/12/18	GHFF, hc	Stringybark
	29/1/19	Nil	Spot Gum
TabNR-rn	10/12/18	SqG, se, 85e10n	Nil
	29/1/19	GHFF	BLkButt
TabNR-rs	10/12/18	ONJ, hc; WTNJ, hc	Nil
	29/1/19	GHFF	Blbutt, Scrb Gum
TabVM-ie	10/12/18	SqG.SE@0s10w	Nil
	29/1/19	Nil	
TabVM-iw	10/12/18	Nil	Nil
	29/1/19	SuG/SqG.SE@200s40w	
TabN-ie	10/12/18	Nil	One small S. Gum
	29/1/19	SuG.SM@350s10e	
TabN-iw	10/12/18	Nil	Nil
	29/1/19	FTGx4.SM@50s3e, ONj, TF	Ironbark
TabN-ce	10/12/18	Tawny, hc	Stringybark
	29/1/19	FtG.SM@250n7e	BBtt
TabN-cw	10/12/18	OnJ, hc	Stringybark
	29/1/19	GHFF	Bbutt
TabDD-rn		Ns	
		Ns	
TabDD-rs		Ns	
		Ns	
TabM-ce	10/12/18	SqG(prob).SE@400s10w, GHFF, ONj	R. Mahogany
	29/1/19		
TabM-cw	10/12/18	GHFF	Nil
	29/1/19		Stringybark sp.
TabM-ie	10/12/18	OnJ, hc	Nil
	29/1/19		Spot gum
TabM-iw	10/12/18	SuG, hc	Nil
	29/1/19		
TabS-ie	10/12/18	Nil	Nil
	29/1/19		Bbutt
TabS-iw	10/12/18	ONJ	Nil
	29/1/19		
TabS-ce	10/12/18	Nil	Grey gum
	29/1/19	SuG,se50n40e	Nil
TabS-cw	10/12/18	SqG,hm100w25s	
	29/1/19	CBtP,se300n30w;ONj	Nil
MOR-ie	10/12/18	Nil	Bbutt
	29/1/19	FtG.sm100n20e; SuG,se400n20e; LRFF	Bbutt, Wh mahog
MOR-iw	10/12/18	Nil	
	29/1/19	SuG,se400s5w	
MOR-ce	10/12/18	GHFF, ONj	
	29/1/19	FtG.sm200n10w; LRFF,	Bbutt
MOR-cw	10/12/18	Nil	
	29/1/19	SqG,se200s10w; ONj	Wh Mahog
MOR-rn	10/12/18	FtG.sm50e20n; ONj	
	29/1/19	YbG,hc200e60s; ONj, LRFF	StrBk, Bbutt
MOR-rs	10/12/18	SuG,hc200e30n; ONj. GHFF	Spot gum, i'bk
	29/1/19	Nil	Nil
TucN-ce	10/12/18	SqG(prob).SE@400s10w, GHFF, ONj	Red mahogany?
	29/1/19	GHFF, LRFF	
TucN-cw	10/12/18	GHFF	Nil
	29/1/19	GHFF, LRFF	
TucM-ce	10/12/18	OnJ, hc	Nil
	29/1/19	Nil	

Transect	Date	Fauna	Flowering
TucM-cw	10/12/18	SuG, hc	
	29/1/19	GG.SE@510n20w, LRFF	
Tuc-r-n	10/12/18	Nil	Wh stringy bk
	29/1/19	GHFF, LRFF	
Tuc-r-s	10/12/18	ONJ	Ibk
	29/1/19	FtG.SM@200n5e, FtG.SM@470n10e, LRFF, GHFF	
TucS-ce	11/12/18	CBTP, se, OnJ, hc	Nil
	30/1/19	SqG.hc 50s40e CBtPoss se 200s20w TF	
TucS-cw	11/12/18	Tawny, hc	Nil
	30/1/19	Nil	
TucN-ie	11/12/18	CBtP.SE@380s4e, ONj	
	30/1/19	Nil	
TucN-iw	11/12/18	SqG.HC@450n5w; CBtP.SE@300n5w, , BBk.HC (off Tran), WtNj.SE@600n20w	
	30/1/19	SgG.se 150s5e FtG se80s5e	Spotted
TucS-ie	11/12/18	SqGx2,hm50s10e & se450s30e; CBP,se200s20e; MO	
	30/1/19	Nil	Grey box
TucS-iw	11/12/18	SqG,sb20s20e	
	30/1/19		
GN-ce	11/12/18	GG x 2, Se, 185n10e	Nil
	30/1/19	GG.se200s80e, GHFF, LRFF	
GN-cw	11/12/18	Tawny, hc	Nil
	30/1/19	GHFF LRFF	
GN-ie	11/12/18	CBtP, se	Nil
	30/1/19	YBG.hc300s80e MO.hc CBtPoss se.400s20e	
GN-iw	11/12/18	PO, hc, 200n30w	Nil
	30/1/19	GHFF	
GS-ie	11/12/18	ONJ	
	30/1/19	CBtPx2,se100n20e	Grey box
GS-iw	11/12/18	SqG,se100s20w	
	30/1/19	CBtP hm, 50ms0	
GS-ce	11/12/18	SuG.HC@60n40e, Dunnart/Planigale	Nil
	30/1/19	SqG.SE@80n13w	
GS-cw	11/12/18	Nil	
	30/1/19	FtG.SG@5n3e	1 spot gum
G-r-n	11/12/18	FtG.SM@400n10w, ONj	Ironbark sp.
	30/1/19	SuG/SqG.470n20w, ONj, LRFF, GHFF	Spot gum
G-r-s	11/12/18	ONJ, TF	Nil
	30/1/19	TFx2, ONj, LRFF	Sf gg, spot gum
S3/M2-ce	11/12/18	FtGx2, sm150s20e	Ibk
	30/1/19	FtG sm170N5w	Ibk
S3/M2-cw	12/12/18	Nil	
	30/1/19	Nil	Ibk
S3/M2-re	12/12/18	GG,se5s25w; CBP,se50s25w; TF; ONj	
	31/1/19	FtG.SG@400w7s, LRFF, GHFF	
S3/M2-rw	12/12/18	SuG, se100w20s; FtGx3,sm100w20s,200w10n	Ibk
	31/1/19	GHFF	
S3-ie	12/12/18	Nil	Nil
	31/1/19	SqG.SE@160s10w	
S3-iw	12/12/18	Nil	Nil
	31/1/19	Ni	
M2-i	12/12/18	Nil	
	31/1/19	Nil	Nil
C3-re	12/12/18	CRtP.SE@-25e5n	Nil
	31/1/19	GHFF	BBUTT
C3-rw	12/12/18	Nil	Nil
	31/1/19	SqGx2,se20s15e &30s15e; YbG,hc80s60e	Nil
C3-ce	12/12/18	Nil	
	31/1/19	SqG.SM@0s15e, LRFF, GHFF	Bloodwood
C3-cw	12/12/18	Nil	
	31/1/19	LRFF, GHFF	
C3-ie	12/12/18	Nil	
	31/1/19	LRFF, GHFF	
C3-iw	12/12/18	CBPx2,hc400s10w	
	31/1/19	LRFF, GHFF, CRtP.SE@100n7e	Bloodwood
C2-c	12/12/18	Nil	Nil

Transect	Date	Fauna	Flowering
	31/1/19	GHFF, LRFF	BButt
C2-rn	12/12/18	GHFF	Grey irnbk
	31/1/19	ONj, TF	StrBk
C2-rs	12/12/18	GG.SE@380s25e, GHFF	Grey irnbk
	31/1/19	GG,se150s60e; ONj	Spot gum
C2-ie	12/12/18	FtGx2,sm500s5e,sm250s1w; CBP,se1000s5w; GHFF	Smooth angoph
	31/1/19	GHFF	
C2-iw	12/12/18	GHFF	White strBk
	31/1/19	M. iteratus. 250s on track. E: 512732, N: 6685919	
S2/M1-c	12/12/18	GHFF, hc	Spotted gum, grey ironbark
	31/1/19	SuG,hc300n50w; GHFF	Grey gum
S2/M1-r	12/12/18	SqG.SE@400e5s, BtPoss sp. HC@-30e20s, ONj, WtNj.HC	Nil
	31/1/19	CBtP,se250e20s; GHFF, LRFF	BButt
S2-i	12/12/18	SuGx2.(SE@230n10e,SE@495n7e), FtG.SM@280n2w, GHFF	Grey irnbk, Ang. costata
	31/1/19	GHFF	
M1-i	Ns		
	ns		
C1-ie	12/12/18	CBtP, se	Nil
	31/1/19	Nil	
C1-iw	12/12/18	Nil	Nil
	31/1/19	Nil	
C1-rn	12/12/18	Nil	
	31/1/19	GHFF	
C1-rs	12/12/18	ONj. GHFF	ibk, spot gum
	31/1/19	ONJ, GHFF	Bbutt
C1-ce	12/12/18	SuG,sm50s10e; CBPx2,200s5e	Wh mahog
	31/1/19	FtG.SM@250n20w, TF, GHFF	Irnbk
C1-cw	12/12/18	Nil	
	31/1/19	GHFF	