

Woolgoolga to Ballina Pacific Highway upgrade

**Phased Resource Reduction for Koala
Wardell Road – Phase 2**

August 2017



Woolgoolga to Ballina Pacific
Highway Upgrade Phased
Resource Reduction for Koala –
Wardell Road phase 2 report.



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Cover Photo: Adult koala, Munro Wharf Road control site.

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1. Introduction

The Woolgoolga to Ballina (W2B) Pacific Highway Upgrade Koala Management Plan proposed a staged approach to clearing in two koala hotspots in Section 10 of the upgrade. Koala hot-spots are situated at Laws Point and Wardell Road. The staged approach is referred to as ‘phased resource reduction’ (PRR) and involves the gradual reduction of food resources by ring-barking and collaring trees to facilitate the voluntary movement of koalas into adjacent habitat. The PRR method aims to reduce stress-induced impacts associated with clearing activities for the new alignment. The project also involves population surveys to monitor koala numbers throughout the PRR process. Due to logistical issues, the PRR program has been staged with work commencing at Laws Point prior to Wardell Road. Sandpiper Ecological (Sandpiper) has been contracted by Pacific Complete to implement the PRR program.

The program includes five phases:

- Phase 1 (Wks 1-3): Tag and map all trees to be collared/ring-barked and undertake six population surveys.
- Phase 2 (Wks 4-5): Collar 40%, ring-bark 20% of trees with continuous canopy to feed trees, ring-bark non-collared trees (DBH 100-300mm), and conduct two population surveys.
- Phase 3 (Wks 6-7): Collar a further 40% of trees, continue ring-barking non-collared trees (DBH 100-300mm), and conduct two population surveys.
- Phase 4 (Wks 8-10): Collar the remaining 20% of trees, finalise ring-barking, and conduct two population surveys.
- Phase 5 (Wks 11-17): Following clearing of the hotspot site undertake eight population surveys.

The following report details the results of Phase 2 of the PRR program at the Wardell Road hotspot site. Phase 2 was undertaken between 17 and 28 July 2017. Work at the Laws Point koala hotspot commenced in March 2017 and is presently in Phase 4 (Sandpiper Ecological 2017a, b & c). Information gained from Laws Point will be used to improve methods at Wardell Road.

2. Study area

The Wardell Road study site is located approximately three kilometres west north west of the town of Wardell on the New South Wales north coast. Access to the site is via Wardell Road through RMS acquired land, adjoining private properties and Hillside Lane. The study site stretches for 1.3 kilometres and encompasses chainages 152200 to 153500 of the Woolgoolga to Ballina (W2B) Pacific Highway Upgrade. The survey area includes the subject site – section of W2B alignment between the abovementioned chainages, and study area – vegetation adjoining the subject site that contains eight, 1.3 km long koala survey transects.

3. Methods

3.1 Tree collaring

Phase 2 requires that 40% of trees with a Diameter at Breast Height (DBH) of >300mm have 600mm wide collars installed between one and two meters above ground. Collars were made of 1.5mm thick High Density Polyethylene (HDPE). HDPE was used as it is lightweight, has a slippery surface, can withstand punctures, is UV stabilised, and is easy to cut and handle in a field situation. Collar size was

determined for each tree by measuring the circumference at 1m (hollow-bearing trees) or 2m (non-hollow-bearing trees) above ground. A three-step ladder was used to install collars at 2m (Plate 1). An additional 100mm was added to each circumference to allow for imperfections in the trunk and to provide a loose fit (Plate 2). Collars were attached using three or four 50-60mm screws. Each tree was inspected for koalas prior to collar installation. Collars were installed loosely around trunks to provide an unstable surface for koalas and enable small scansorial fauna to move up and down trunks. Phase 2 collaring was undertaken between 17 and 22 July 2017.



Plate 1: Procedure used to install collars during the Phased Resource Reduction for koalas.



Plate 2: Example of a loosely fitted collar with a gap around the trunk to reduce a koalas grip on the collar.

3.2 Ring-barking

During Phase 2, trees were ring-barked that did not have a road, access track, dwelling, or power line within their fall zone, or were within 10m of the LoC boundary. An arborist determined if it was safe to ring-bark trees. Ring-barking was undertaken by Blue Knob Tree Fellas and Sandpiper Ecological and was conducted using a chainsaw and axe. Trees were ring-barked by making two parallel cuts, approximately 100mm apart in the trunk. Bark and sapwood was then removed with an axe. The depth of chainsaw cuts varied depending on trunk diameter. Trees with a DBH between 100 and 200mm had bark only removed, with the sapwood left intact. This was done due to concern about the stability of trees if sapwood was removed, particularly from tall thin swamp oaks (*Casuarina glauca*). If deemed safe by the arborist an aggressive approach was adopted to ring-barking trees between 200 and 300mm DBH to maximise the likelihood of defoliation with the 6-week period between Phase 2 and clearing. Ring-barking was undertaken between 18 and 20 July 2017.

All feed trees with a DBH greater than 100mm were assessed for ring-barking. Feed trees with a DBH less than 150mm had bark only removed, whilst other trees had bark and sapwood removed.

3.3 Koala population monitoring

3.3.1 Koala surveys

One paired (diurnal & nocturnal) koala population monitoring survey was conducted in Phase 2 and follows on from the three diurnal, and three nocturnal koala population monitoring surveys conducted in Phase 1 (Sandpiper Ecological 2017d). Nocturnal surveys preceded diurnal surveys, which were conducted on the following day. Surveys were completed by one team of three and included one person walking the transect centre line flanked by a person 20m away on each side. Nocturnal surveys were conducted with handheld spotlights (Led Lenser P14) and all personnel were

equipped with binoculars for both nocturnal and diurnal surveys. Each 1.3km transect took approximately 30 minutes to complete. The Phase 2 population survey was conducted on 25 and 26 July 2017. Phase 1 population surveys, at Wardell Road, were conducted on 30 and 31 May, 5 and 6 June and 3 and 4 July 2017. During Phase 2 access was denied to another property containing transects 1 and 2, which, when combined with previous access restrictions, means that the northern 400m of those transects was not sampled.

Data recorded during each survey included; date, survey number, observer names, start and end time, temperature range, cloud cover, wind, rain and moon phase. Data collected on each koala observed included: date, time, transect number, coordinates (easting & northing GDA 94), tree species including DBH, temperature, weather, sex, breeding status, and health (i.e. signs of conjunctivitis or cystitis). Each tree with a koala was marked with red and white tape so it could be re-located the following day.

3.3.2 Scat collection

To support a study being undertaken by Roads and Maritime Services and Sydney University on cortisol levels in koalas fresh koala scats were collected at Wardell Road (impact site) and Tucki Tucki (control site) following each diurnal survey. At Wardell Road, each tree containing a koala, or where a koala was recorded the previous night, was revisited and a search conducted for fresh koala scats. Fresh scats were identified by their colour (paler green) and presence of a moist coating. Scats were subsequently collected from the same number, and if possible same sex ratio, of koalas at Tucki Tucki. The Tucki Tucki site was visited on the afternoon following the diurnal koala survey at Laws Point and trees containing suitable koalas were marked. These trees were revisited the following morning and fresh scats collected. Where possible between five and six scats were collected from each tree and scat collection was conducted during dry weather. As per Phase 1 control site scats for the Wardell Road sample were collected from Hazlemount Lane.

Data collected at each scat collection site included; location (easting & northing GDA 94), tree species, weather (temperature, cloud cover, rainfall), time since last sunny day, tree size, koala behaviour, koala health, date, and observer. Scats were collected with a toothpick and placed immediately into a Styrofoam block positioned in a plastic container (Plate 3). Scats were then stored in a cool dry location.



Plate 3: Scats being collected at the Tucki Tucki control site.

4. Results

4.1 Collaring

A total of 113 trees containing 121 stems were collared in Phase 2 (Figures 1 & 2). This equates to 37% of trees to be collared. One habitat tree, 111 non-habitat trees and six koala feed trees were collared. No koalas were recorded during tree collaring in Phase 2. Collaring commenced in the centre of the alignment and extended for the entire length of the Wardell Road Hotspot area. Two additional, previously unmarked, trees were identified and collared during Phase 2, bringing the total number of trees to be collared at Wardell Road to 299.

4.2 Ring-barking

Five mature (overstorey) and 13 immature (understorey) feed trees were ring-barked (Figure 3). No trees with a DBH > 300mm with continuous canopy to feed trees were ring-barked. All 100-300mm DBH trees that did not have a power line, vehicle access track, road, or dwelling within their fall zone, or were within 10m of the LoC boundary were ring-barked. Ring-barking tall swamp oaks (*Casuarina glauca*) with a small DBH was considered likely to create a risk of tree fall. Consequently, a cautious approach was adopted to ring-barking in areas of dense swamp oak. Swamp oaks with a DBH between 100 and 200mm had bark only removed. No trees were ring-barked within 10m of the LoC boundary. Five trees with a DBH < 200mm were deemed unsound following initial cuts and were subsequently felled.

4.2.1 Trees with continuous canopy

No trees with continuous canopy to feed trees were ring-barked in Phase 2. Clusters of trees surrounding a focal feed trees were assessed, with two clusters deemed suitable for ring-barking. One cluster was within 10m of the LoC boundary and the other had power lines on two sides.

4.3 Koala population surveys

4.3.1 Koala surveys

Phase 2 koala population surveys were conducted on 25 and 26 July 2017. One koala, an adult female, was recorded during the day and night survey (Figure 4). The koala was recorded inside the LoC boundary during the night survey but had moved just outside the boundary during the subsequent day survey (Figure 5). The Phase 2 koala record is in a new location to Phase 1 records but corresponds with sightings by the nearby resident who recorded two individuals in the area following completion of the Phase 1 survey.

A total of eight koala records have been made during the four paired (day & night) population surveys (Table 1). Four records have occurred at night, and four during the day. No ear-tagged individuals have been recorded. All individuals recorded at the Wardell Road hotspot have shown signs of disease (i.e. brown or wet bottom and/or conjunctivitis). Weather conditions during the Phase 2 population survey are summarised in Table A3, Appendix A.

4.3.2 Scat Collection

In Phase 2 scats were collected from two koalas, one at the impact site and one at the control site (Hazlemount Lane, Tucki Tucki) (Table A4, Appendix A). Between three and six scats have been collected for each sample and no rainfall was recorded 24hrs prior to scat collection.

4.4 Koala specialist site inspection

Dr Sean Fitzgibbon inspected the Wardell Road hotspot site on Wednesday 26 July, following completion of the Phase 2 collaring and ring-barking. The inspection involved a foot-based traverse of the site looking at tree collars and ring-barking.

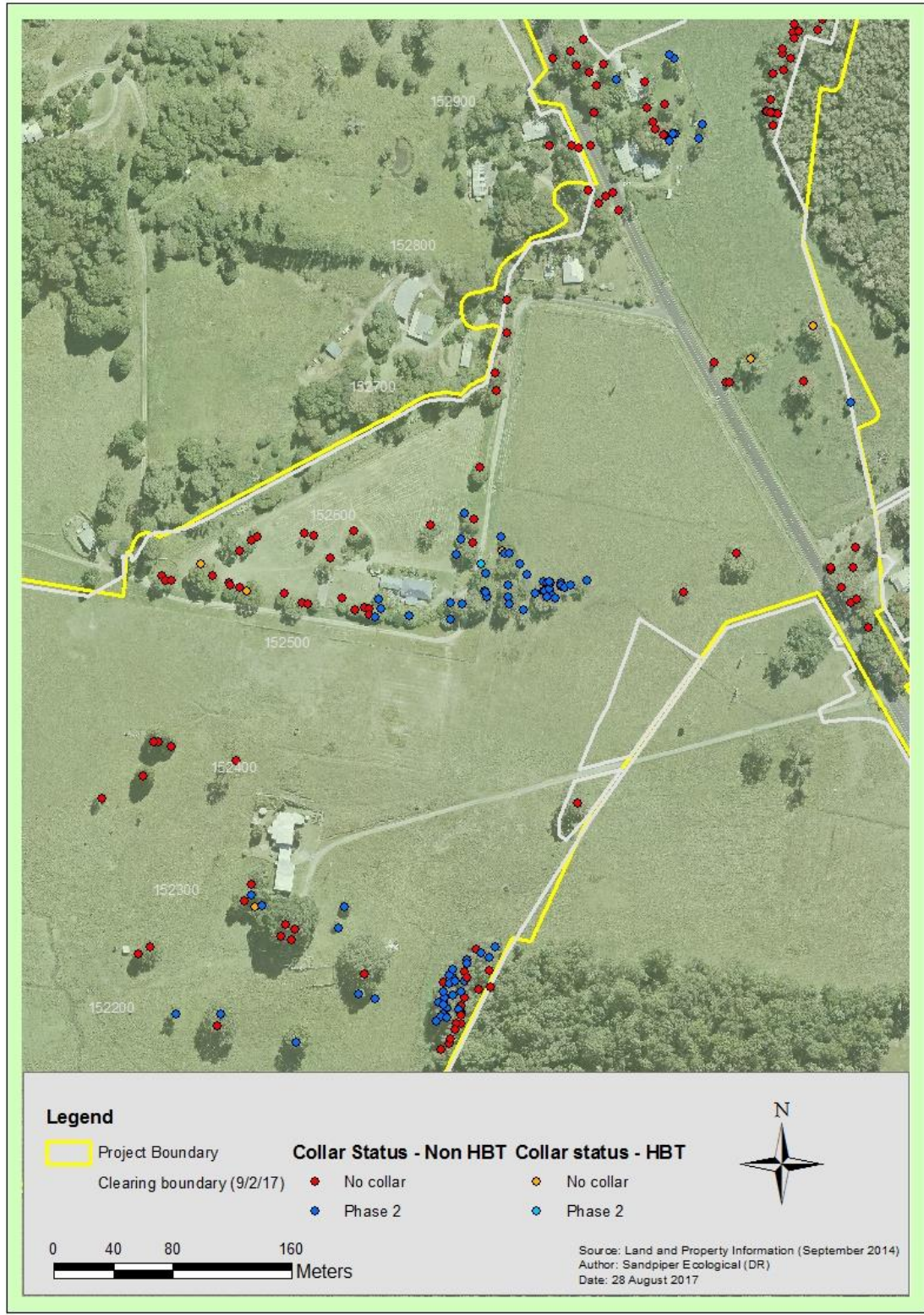


Figure 1: Distribution and status of all trees (DBH >300mm) within the Wardell Road site following Phase 2 of the PRR program.

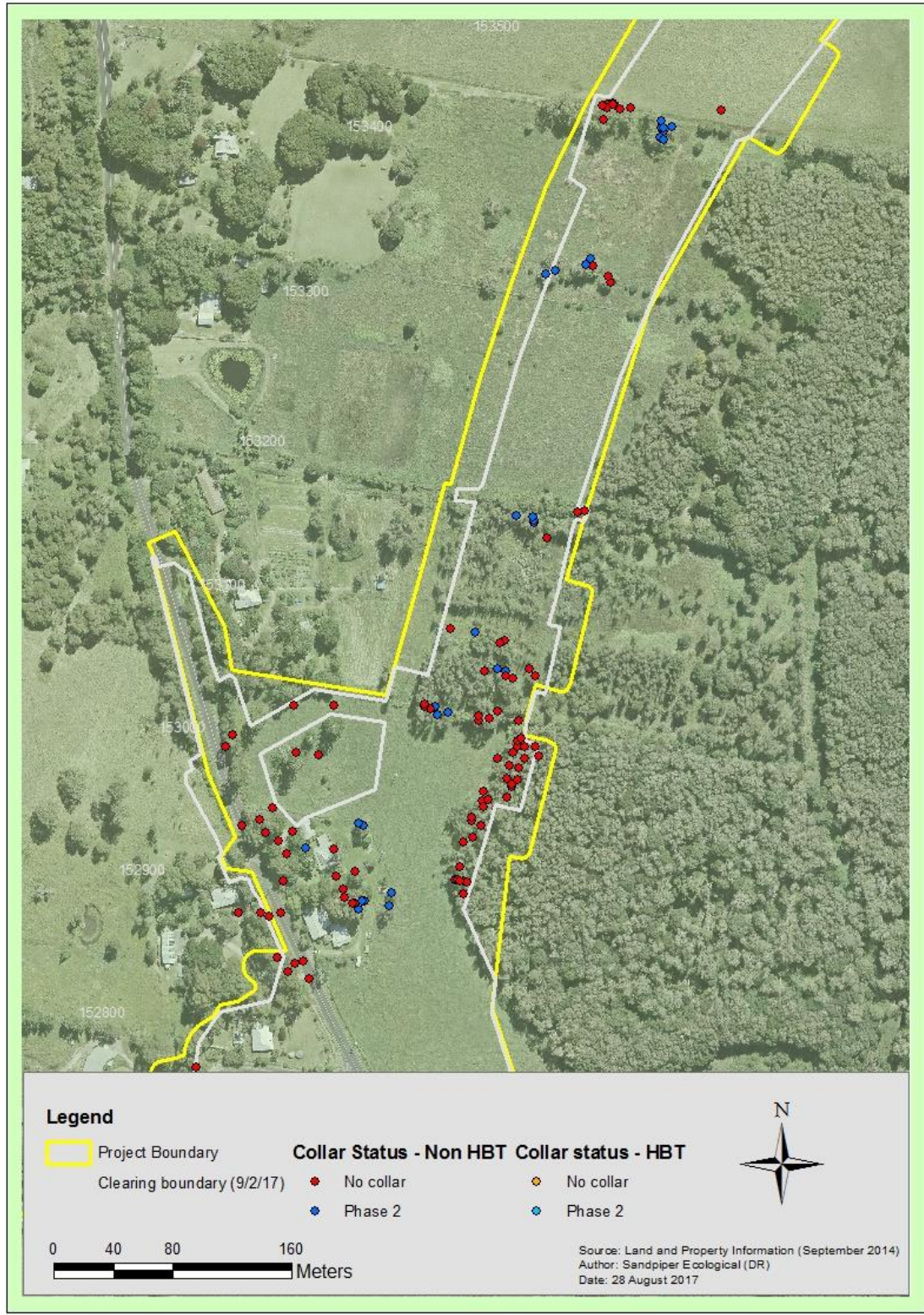


Figure 2: Distribution and status of all trees (DBH >300mm) within the Wardell Road site following Phase 2 of the PRR program.

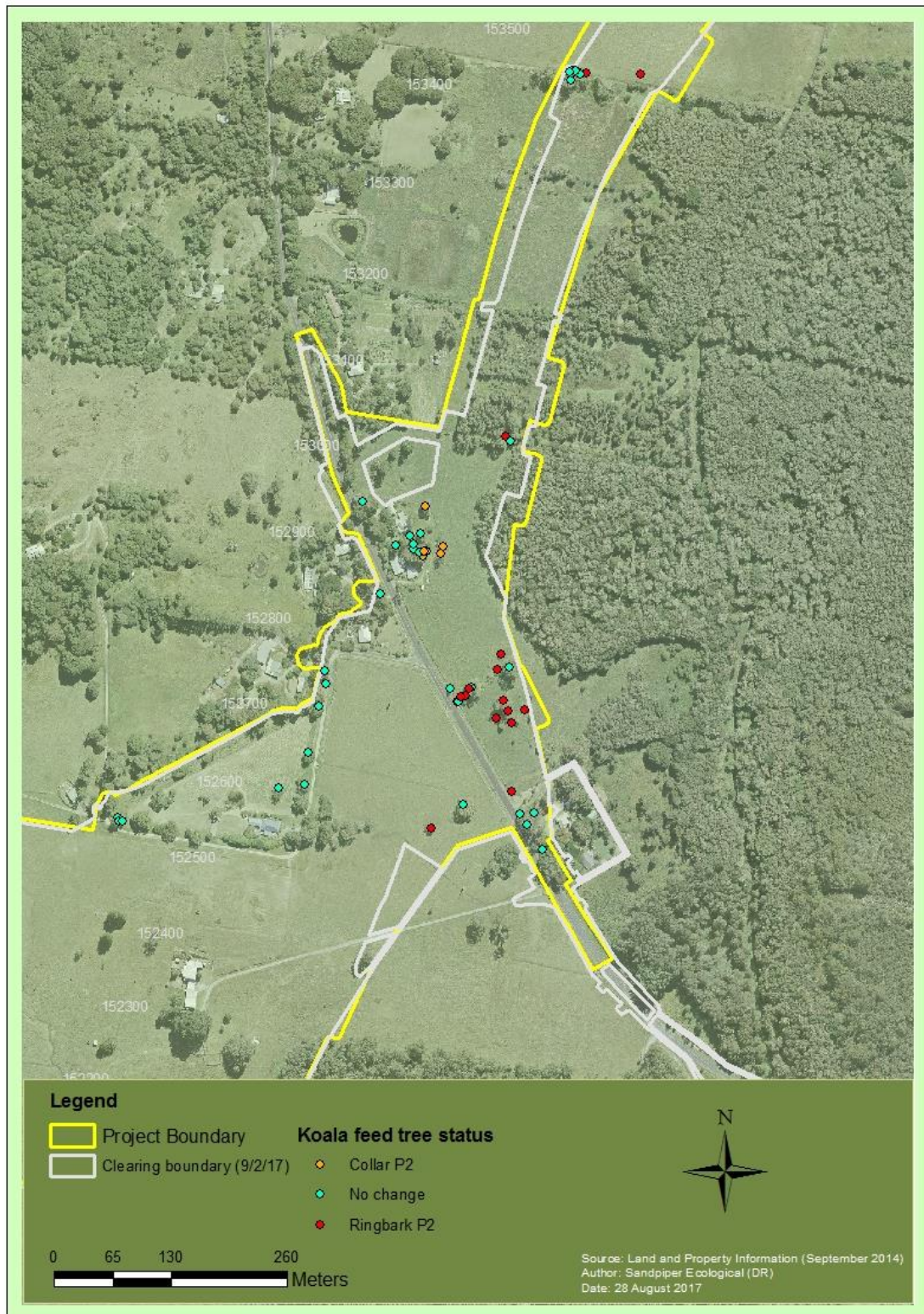


Figure 3: Status of koala feed trees within the Wardell Road hotspot area following Phase 2 of the PRR program.

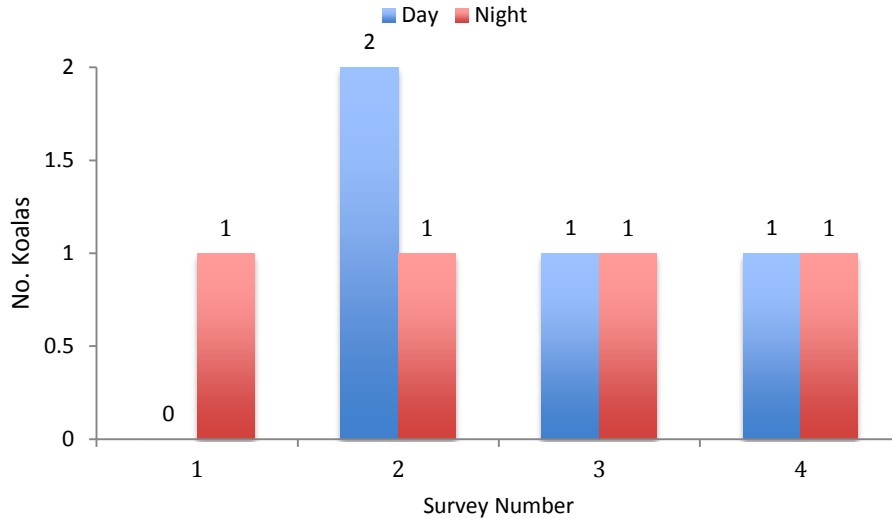


Figure 4: Number of koalas recorded during paired day and night surveys during Phase 1 (surveys 1-3) and 2 (survey 4) at Wardell Road.

Table 1: Koala records obtained during the Phase 1 (baseline) koala surveys at Wardell Road. pr = probable identification.

Date	Record No.	Same Individual as	Time (D/N)	Transect	Tree sp.	Sex	Breeding	Health
30/5/2017	WK1		N	1	Forest red gum	M(pr)	Nil	Dry, stained rump
5/6/2017	WK2		N	1	Forest red gum	F(pr)	Nil	Stained rump
6/6/2017	WK2.1	WK2	D	1	Forest red gum	F(pr)	Nil	Wet, stained rump
6/6/2017	WK3	WK1	D	2	Forest red gum	M(pr)	Nil	Wet, stained rump
3/7/17	WK4	WK1	N	1	Narrow-leaved red gum	M(pr)	Nil	View obscured, rump stained
4/7/17	WK4.1	WK1	D	1	Forest red gum	M(pr)	Nil	View obscured, slightly stained rump
25/7/17	WK5		N	7	Forest red gum	F(Pr)	Nil	Dirty (brown) bottom
26/7/17	WK6	WK5	D	8	Forest red gum	F(Pr)	Nil	Dirty (brown) bottom

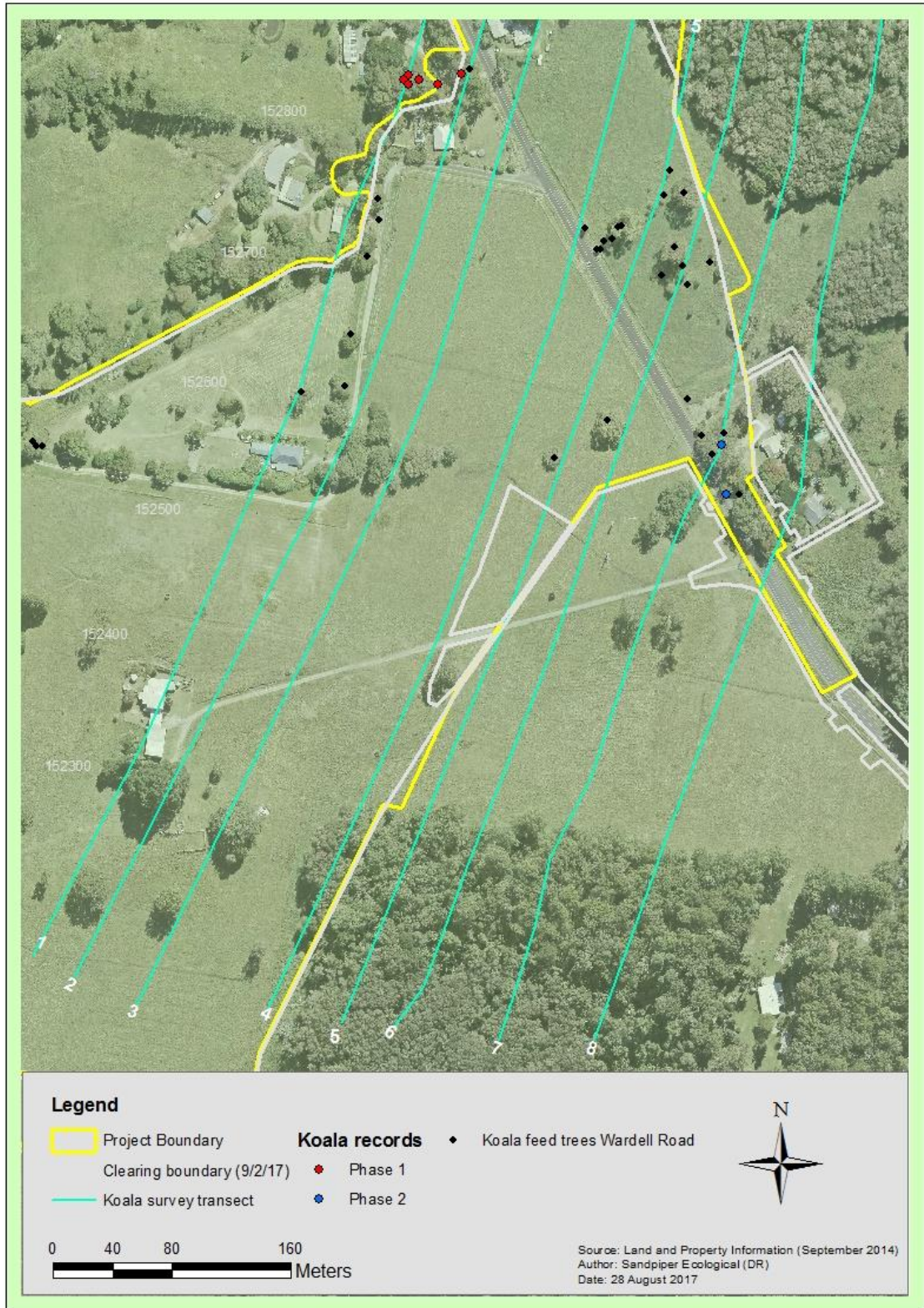


Figure 5: Distribution of koala records following Phase 2 of the PRR program at the Wardell Road hotspot site.

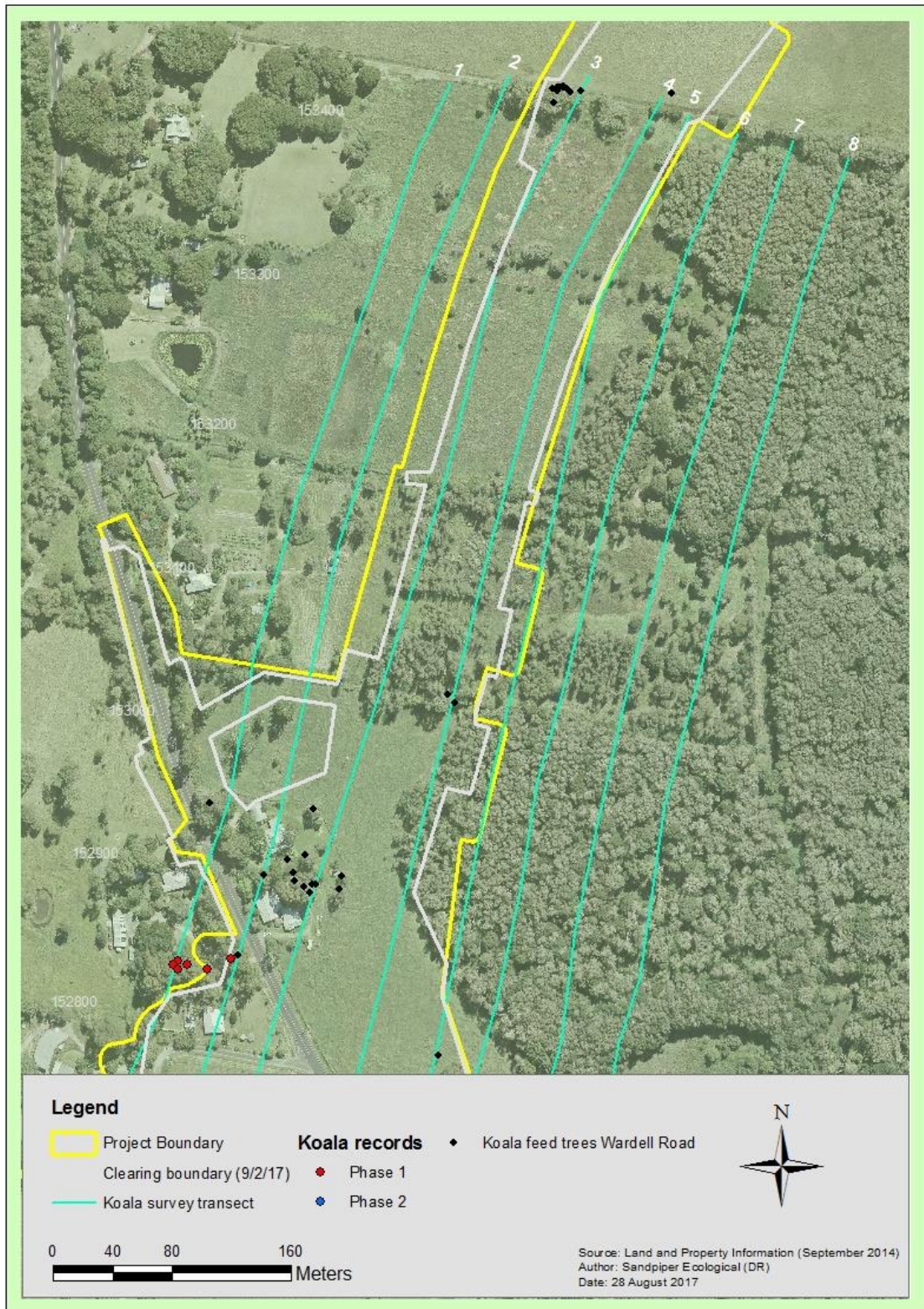


Figure 6: Distribution of koala records following Phase 2 of the PRR program at the Wardell Road hotspot site.

5. Discussion

5.1 Collaring and ring-barking

All efforts were made to commence collaring within the central section of the alignment in Phase 2. The patchy distribution of trees made this approach difficult and most suitable trees were collared in the northern third of the hotspot area. Extending outwards from the central part of the site will be even more difficult in Phase 3 and it is likely that some entire patches of suitable trees will be collared at that time. In general, collaring of trees has occurred without issue. The reduced proportion of trees collared in Phase 2, i.e. 37%, is attributed to an attempt to restrict collaring to the central part of the site.

Roads, dwellings, access tracks, power lines and the 10m to LoC boundary restriction compromised the completeness of ring-barking. Restrictions imposed by the above features meant that numerous trees with a DBH between 100 and 300mm were not ring-barked in Phase 2. In addition, the ring-barking method was compromised by tree species and growth habit. Tall thin swamp oaks represent a high risk of falling over if sapwood was removed. Consequently, ring-barking of swamp oaks was restricted to removal of bark only and it is unlikely that these trees will die-back during the PRR timeframe.

Increased ring-barking of koala feed trees, as recommended in the Phase 1 report (Sandpiper 2017d), was not implemented in Phase 2 due to restrictions imposed by power lines, roads, dwellings and access tracks. Of the 62 feed trees identified in the hotspot area, 18 were ring-barked and six were collared. Ring-barking of feed trees in phase 2 was limited by proximity to roads, power lines and the LoC boundary. Further discussion within the project team is required to determine if the number of trees ring-barked can be increased. Evidence gathered at Laws Point showed that ring-barking was particularly effective in causing rapid wilt of eucalypts and making trees less attractive to koalas.

5.2 Koala population survey

Eight koala records have been obtained at Wardell Road, six during Phase 1 and two during Phase 2. The number of individuals recorded in the Wardell Road hotspot study area has ranged from 1-2 and the number recorded in Phase 2 is consistent with baseline surveys. The female recorded in Phase 2 is most likely a different individual to that recorded in Phase 1 and suggests that at least three individuals utilise habitat in the study area.

The three individuals recorded have all displayed obvious signs of cystitis (i.e. wet dripping bottom) and one female also showed evidence of conjunctivitis. These unhealthy individuals pose a risk to other koalas in the population (OEH 2011). Biolink and Ecosure (2015) stated that “chronic clinical expression of disease appeared to be primarily restricted to localities between Meerschaum Vale and Lynwood” north of the Wardell Road hotspot. Whilst there is likely to be a distinction between chronic disease recorded by Biolink and Ecosure (2015) and our general observations of disease the results obtained at the Wardell Road hotspot suggest that the frequency of disease in the population extends south of Meerschaum Vale.

The apparent high incidence of unhealthy koalas at Wardell Road is contrary to the findings of Phillips *et al.* (2015, cited by Niche 2016) but is consistent with the Population Viability Analysis (PVA) that highlighted disease as a potential factor limiting population size through low fecundity (Niche 2016). Four of the nine records confirmed by the project team were situated inside the LoC boundary. Six of

the eight population survey records and one opportunistic record were of individuals in forest red gums.

Data collected in Phase 1 is insufficient to enable any assessment of koala home range, apart from suggesting that one adult male occupies a home range that encompasses habitat on both sides of Wardell Road, and that individual, plus an adult female utilise habitat on the eastern slope of Buckombil Mountain to the west of the alignment. In addition to its present health status the male is at risk of road strike when crossing Wardell Road. Five feed trees east of Wardell Road were collared in Phase 2 leaving approximately five additional feed trees accessible in the same area. Once these trees are collared, in subsequent phases, any crossing of Wardell Road will be not yield foraging benefits. Monitoring of feed trees east of Wardell Road with cameras will assist in determining the extent of visitation by koalas.

If the baseline data are considered an accurate indication of koala habitat use in early winter then the initial collaring of trees, through the centre of the alignment, would have negligible impact on koalas as most individuals are using resources outside, or near the western and eastern edges of the alignment. Movement of koalas into and through the subject site is expected over the course of the PRR program.

5.3 Recommendations

1. Feed trees within 10m of the LoC boundary should be reviewed to assess suitability / feasibility for ring-barking.
2. The cluster of large figs near the southern end of the Wardell Road hotspot area (i.e. near chainage 152300) should be excluded by installing a basic exclusion fence consisting of star pickets and chicken wire. The fence should have a 100mm gap at the bottom to allow other fauna to enter and exit the trees. A bottom strand of tensioned plain wire should be installed to stop koalas pushing under the fence.
3. During Phase 3 trees should be collared in clusters as they are encountered, with the progression of collaring from the central section being a secondary consideration.

4. References

Niche Environment and Heritage (2016). *Ballina Koala Plan: koala population viability analysis of the proposed Pacific Highway Upgrade near Wardell, NSW*. Report prepared for NSW Roads and Maritime Services.

OEH (2011). *Code of practice for injured, sick and orphaned koalas*. State of NSW and Office of Environment and Heritage, Sydney.

Sandpiper Ecological (2017a). *Woolgoolga to Ballina Pacific Highway Upgrade Phased Resource Reduction for Koala – phase 1 Laws Point*. Report prepared for Pacific Complete.

Sandpiper Ecological (2017b). *Woolgoolga to Ballina Pacific Highway Upgrade Phased Resource Reduction for Koala – phase 2 Laws Point*. Report prepared for Pacific Complete.

Sandpiper Ecological (2017c). *Woolgoolga to Ballina Pacific Highway Upgrade Phased Resource Reduction for Koala – phase 3 Laws Point*. Report prepared for Pacific Complete.

Sandpiper Ecological (2017d). *Woolgoolga to Ballina Pacific Highway Upgrade Phased Resource Reduction for Koala – phase 1 Wardell Road*. Report prepared for Pacific Complete.

Appendix A – Field data

Table A1: Collared trees identified in the Wardell Road study area. Decimal indicates co-dominant trunk; Circumf = circumference.

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
15.5.17	DR & SR	C1	Forest red gum	542725	6798702	1444	4.54	No collar
15.5.17	DR & SR	C4	Camphor Laurel	542744	6798646	545	1.7	Phase 2
15.5.17	DR & SR	C5	Forest red gum	542667	6798544	795	2.49	No collar
15.5.17	DR & SR	C5.1				477	1.5	No collar
15.5.17	DR & SR	C5.2				448	1.4	No collar
15.5.17	DR & SR	C5.3				385	1.21	No collar
15.5.17	DR & SR	C6	Forest red gum	542631	6798518	499	1.57	No collar
15.5.17	DR & SR	C6.1				315	0.99	No collar
15.5.17	DR & SR	C6.2				372	1.17	No collar
15.5.17	DR & SR	C6.3				236	0.75	No collar
15.5.17	DR & SR	C7	Grey Ironbark	542560	6798376	1100	3.45	No collar
15.5.17	DR & SR	C8	Broad-leaved paperbark	542504	6798279	555	1.74	Phase 2
15.5.17	DR & SR	C9	Broad-leaved paperbark	542492	6798277	963	3.02	No collar
15.5.17	DR & SR	C10	Broad-leaved paperbark	542485	6798270	561	1.76	Phase 2
15.5.17	DR & SR	C11	Tuckeroo	542485	6798268	350	0.95	Phase 2
15.5.17	DR & SR	C12	Broad-leaved paperbark	542500	6798272	314	0.99	Phase 2
15.5.17	DR & SR	C13	Broad-leaved paperbark	542495	6798275	356	1.12	Phase 2
15.5.17	DR & SR	C14	Pink bloodwood	542500	6798263	428	1.35	No collar
15.5.17	DR & SR	C15	Broad-leaved paperbark & strangler fig	542501	6798252	495	1.55	No collar
15.5.17	DR & SR	C16	Broad-leaved paperbark	542484	6798262	300	0.94	No collar
15.5.17	DR & SR	C16.1				305	0.97	No collar
15.5.17	DR & SR	C16.2				398	1.25	No collar
15.5.17	DR & SR	C16.3				248	0.78	No collar
15.5.17	DR & SR	C16.4				219	0.69	No collar
15.5.17	DR & SR	C16.5				178	0.56	No collar
15.5.17	DR & SR	C17	Strangler fig	542484	6798256	480	1.5	Phase 2
15.5.17	DR & SR	C18	Strangler fig	542485	6798258	290	0.9	No collar
15.5.17	DR & SR	C19	Strangler fig	542485	6798258	449	1.41	No collar
15.5.17	DR & SR	C20	Swamp box	542493	6798250	360	1.12	No collar
15.5.17	DR & SR	C21	Broad-leaved paperbark	542484	6798245	575	1.8	No collar
15.5.17	DR & SR	C22	Broad-leaved paperbark & strangler fig	524480	6798254	480	1.5	Phase 2
15.5.17	DR & SR	C22.1				450	1.41	Phase 2
15.5.17	DR & SR	C23	Broad-leaved paperbark	542469	6798255	560	1.76	No collar
15.5.17	DR & SR	C24	Broad-leaved paperbark	542476	6798258	346	1.09	Phase 2
15.5.17	DR & SR	C24.1				262	0.82	Phase 2
15.5.17	DR & SR	C25	Broad-leaved Paperbark	542473	6798260	310	0.97	Phase 2
15.5.17	DR & SR	C26	Broad-leaved paperbark	542476	6798264	403	1.26	Phase 2
15.5.17	DR & SR	C27	Broad-leaved paperbark	542473	6798254	368	1.16	Phase 2
15.5.17	DR & SR	C27.1				282	0.89	Phase 2
15.5.17	DR & SR	C28	Broad-leaved paperbark	542477	6798256	395	1.24	Phase 2

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
15.5.17	DR & SR	C29	Broad-leaved paperbark	542481	6798249	369	1.16	Phase 2
15.5.17	DR & SR	C30	Broad-leaved paperbark	542476	6798246	550	1.73	Phase 2
15.5.17	DR & SR	C31	Broad-leaved paperbark	542481	6798239	373	1.17	No collar
15.5.17	DR & SR	C32	Broad-leaved paperbark	542481	6798235	374	1.18	No collar
15.5.17	DR & SR	C33	Broad-leaved paperbark	542481	6798234	301	0.95	No collar
15.5.17	DR & SR	C34	Broad-leaved paperbark	542469	6798242	432	1.36	Phase 2
15.5.17	DR & SR	C35	Broad-leaved paperbark	542469	6798240	352	1.11	Phase 2
15.5.17	DR & SR	C36	Broad-leaved paperbark	542470	6798245	301	0.94	Phase 2
15.5.17	DR & SR	C37	Broad-leaved paperbark	542472	6798238	465	1.46	Phase 2
15.5.17	DR & SR	C38	Broad-leaved paperbark	542466	6798242	501	1.56	Phase 2
15.5.17	DR & SR	C39	Broad-leaved paperbark	542469	6798249	580	1.82	Phase 2
15.5.17	DR & SR	C40	Broad-leaved paperbark	542469	6798240	438	1.38	Phase 2
15.5.17	DR & SR	C41	Broad-leaved paperbark	542480	6798237	313	0.99	Phase 2
15.5.17	DR & SR	C42	Broad-leaved paperbark	542481	6798233	339	1.07	No collar
15.5.17	DR & SR	C43	Broad-leaved paperbark	542470	6798234	313	0.99	Phase 2
15.5.17	DR & SR	C44	Broad-leaved paperbark	542469	6798234	325	1.02	Phase 2
15.5.17	DR & SR	C45	Broad-leaved paperbark	542468	6798232	350	1.1	Phase 2
15.5.17	DR & SR	C46	Broad-leaved paperbark	542465	6798229	632	1.98	Phase 2
15.5.17	DR & SR	C46.1				395	1.24	Phase 2
15.5.17	DR & SR	C47	Broad-leaved paperbark	542472	6798231	462	1.45	Phase 2
15.5.17	DR & SR	C48	Broad-leaved paperbark	542481	6798227	466	1.46	No collar
15.5.17	DR & SR	C49	Broad-leaved paperbark	542478	6798227	445	1.4	No collar
15.5.17	DR & SR	C49.1				256	0.8	No collar
15.5.17	DR & SR	C50	Ficus spp.	542477	6798223	575	1.8	No collar
15.5.17	DR & SR	C51	Swamp box	542473	6798214	385	1.21	No collar
15.5.17	DR & SR	C52	Swamp box	542474	6798217	322	1.01	No collar
15.5.17	DR & SR	C53	Swamp box	542468	6798210	427	1.35	No collar
15.5.17	DR & SR	C54	Broad-leaved paperbark	542433	6798187	797	2.5	No collar
15.5.17	DR & SR	C55	Broad-leaved paperbark	542434	6798185	627	1.97	No collar
15.5.17	DR & SR	C56	White mahogany	542370	6798215	1411	4.43	Phase 2
15.5.17	DR & SR	C57	Strangler fig	542360	6798286	1022	3.21	No collar
15.5.17	DR & SR	C58	Strangler fig	542367	6798284	2500	7.85	No collar
15.5.17	DR & SR	C59	Strangler fig	542369	6798291	3700	11.62	No collar
15.5.17	DR & SR	C60	Strangler fig	542363	6798294	3400	10.68	No collar
15.5.17	DR & SR	C61	Sweet pittosporum	542399	6798292	386	1.21	Phase 2
15.5.17	DR & SR	C62	Stag	542403	6798306	474	1.49	Phase 2
15.5.17	DR & SR	C63	Strangler fig	542416	6798261	3100	9.74	No collar
15.5.17	DR & SR	C64	Camphor laurel	542423	6798244	540	1.7	Phase 2
15.5.17	DR & SR	C65	Cheese tree	542412	6798247	443	1.39	Phase 2
15.5.17	DR & SR	C66	Strangler fig	542317	6798226	1646	5.17	No collar
15.5.17	DR & SR	C67	Tuckeroo	542319	6798234	307	0.97	Phase 2
15.5.17	DR & SR	C68	Unidentified sp.	542289	6798234	501	1.57	Phase 2
15.5.17	DR & SR	C69	Camphor Laurel	542264	6798274	384	1.2	No collar
15.5.17	DR & SR	C70	Camphor Laurel	542272	6798279	1012	3.18	No collar
16.5.17	DR & SR	C71	Cypress pine	542347	6798307	818	2.57	Phase 2
16.5.17	DR & SR	C72	Cypress pine	542340	6798314	435	1.37	Phase 2

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
16.5.17	DR & SR	C73	Cypress pine	542335	6798310	550	1.73	No collar
16.5.17	DR & SR	C73.1				365	1.15	No collar
16.5.17	DR & SR	C74	Mango	542340	6798321	370	1.17	No collar
16.5.17	DR & SR	C75	Grey Ironbark	542330	6798404	714	2.24	No collar
16.5.17	DR & SR	C76	Camphor Laurel	542286	6798414	550	1.73	No collar
16.5.17	DR & SR	C77	Camphor Laurel	542275	6798417	389	1.22	No collar
16.5.17	DR & SR	C77.1				381	1.2	No collar
16.5.17	DR & SR	C78	Camphor Laurel	542277	6798417	500	1.57	No collar
16.5.17	DR & SR	C78.1				562	1.76	No collar
16.5.17	DR & SR	C79	Camphor Laurel	542274	6798417	499	1.57	No collar
16.5.17	DR & SR	C80	Camphor Laurel	542267	6798394	515	1.62	No collar
16.5.17	DR & SR	C80.1				460	1.44	No collar
16.5.17	DR & SR	C80.2				675	2.12	No collar
16.5.17	DR & SR	C80.3				673	2.11	No collar
16.5.17	DR & SR	C81	Tuckeroo	542239	6798379	418	1.31	No collar
25.5.17	DR & ZE	C82	Swamp mahogany	542280	6798529	600	1.88	No collar
25.5.17	DR & ZE	C83	Swamp mahogany	542280	6798529	310	0.86	No collar
25.5.17	DR & ZE	C84	Swamp mahogany	542282	6798526	250	0.77	No collar
25.5.17	DR & ZE	C85	Swamp mahogany	542286	6798526	433	1.34	No collar
25.5.17	DR & ZE	C86	White mahogany	542314	6798529	735	2.31	No collar
25.5.17	DR & ZE	C87	Tuckeroo	542325	6798524	485	1.52	No collar
25.5.17	DR & ZE	C88	Mango	542326	6798523	310	0.97	No collar
25.5.17	DR & ZE	C88.1				370	1.16	No collar
25.5.17	DR & ZE	C89	Mango	542332	6798521	335	1.06	No collar
25.5.17	DR & ZE	C90	Pink bloodwood	542332	6798546	108	3.4	No collar
25.5.17	DR & ZE	C91	Hoop pine	542340	6798553	475	1.5	No collar
25.5.17	DR & ZE	C92	Mango	542344	6798555	430	1.35	No collar
25.5.17	DR & ZE	C93	Eucalyptus spp.	542362	6798517	355	1.12	No collar
25.5.17	DR & ZE	C94	White Mahogany	542374	6798511	945	2.97	No collar
25.5.17	DR & ZE	C95	White mahogany	542378	6798510	443	1.39	No collar
25.5.17	DR & ZE	C96	Broad-leaved paperbark	542376	6798558	320	1.02	No collar
25.5.17	DR & ZE	C97	Broad-leaved paperbark	542382	6798556	380	1.2	No collar
25.5.17	DR & ZE	C98	African tulip	542409	6798559	380	1.19	No collar
25.5.17	DR & ZE	C99	Blackbutt	542393	6798541	517	1.65	No collar
25.5.17	DR & ZE	C100	Mango	542401	6798514	728	2.29	No collar
25.5.17	DR & ZE	C101	Mango	542410	6798506	400	1.26	No collar
25.5.17	DR & ZE	C101.1				271	0.85	No collar
25.5.17	DR & ZE	C102	Mango	542416	6798508	516	1.62	No collar
25.5.17	DR & ZE	C103	Mango	542419	6798507	477	1.5	No collar
25.5.17	DR & ZE	C104	Mango	542419	6798503	510	1.6	No collar
25.5.17	DR & ZE	C105	Mango	542423	6798501	291	0.92	Phase 2
25.5.17	DR & ZE	C105.1				260	0.81	Phase 2
25.5.17	DR & ZE	C105.2				307	0.98	Phase 2
25.5.17	DR & ZE	C106	Mango	542427	6798507	224	0.69	Phase 2
25.5.17	DR & ZE	C106.1				205	0.68	Phase 2
25.5.17	DR & ZE	C106.2				200	0.63	Phase 2

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
25.5.17	DR & ZE	C107	Mango	542426	6798513	222	0.7	Phase 2
25.5.17	DR & ZE	C107.1				370	1.17	Phase 2
25.5.17	DR & ZE	C107.2				357	1.12	Phase 2
25.5.17	DR & ZE	C107.3				230	0.71	Phase 2
25.5.17	DR & ZE	C107.4				320	1.01	Phase 2
25.5.17	DR & ZE	C108	Mango	542446	6798502	255	0.8	Phase 2
25.5.17	DR & ZE	C108.1				420	1.32	Phase 2
25.5.17	DR & ZE	C108.2				460	1.45	Phase 2
25.5.17	DR & ZE	C108.3				207	0.65	Phase 2
25.5.17	DR & ZE	C109	Mango	542474	6798500	275	0.87	No collar
25.5.17	DR & ZE	C109.1				264	0.82	No collar
25.5.17	DR & ZE	C109.2				267	0.82	No collar
25.5.17	DR & ZE	C109.3				208	0.65	No collar
25.5.17	DR & ZE	C109.4				232	0.73	No collar
25.5.17	DR & ZE	C109.5				230	0.72	No collar
25.5.17	DR & ZE	C109.6				365	1.14	No collar
25.5.17	DR & ZE	C110	Mango	542474	6798511	387	1.22	No collar
25.5.17	DR & ZE	C110.1				315	0.99	No collar
25.5.17	DR & ZE	C111	Grey Ironbark	542482	6798510	1015	3.18	No collar
25.5.17	DR & ZE	C112	Mango	542478	6798543	440	1.38	No collar
25.5.17	DR & ZE	C113	Mango	542481	6798554	380	1.2	No collar
25.5.17	DR & ZE	C114	Swamp mahogany	542461	6798563	525	1.64	No collar
25.5.17	DR & ZE	C115	Mango	542484	6798571	288	0.9	No collar
25.5.17	DR & ZE	C115.1				217	0.68	No collar
25.5.17	DR & ZE	C115.2				195	0.62	No collar
25.5.17	DR & ZE	C115.3				246	0.78	No collar
25.5.17	DR & ZE	C116	Tallowwood	542494	6798602	550	1.73	No collar
25.5.17	DR & ZE	C117	Tallowwood	542505	6798654	560	1.76	No collar
25.5.17	DR & ZE	C118	Moreton bay fig	542504	6798666	1258	3.96	No collar
25.5.17	DR & ZE	C119	Tallowwood	542512	6798693	460	1.44	No collar
25.5.17	DR & ZE	C120	Cadagi	542512	6798715	445	1.4	No collar
25.5.17	DR & ZE	C121	Forest red gum	542490	6798567	754	2.36	No collar
25.5.17	DR & ZE	C122	Grey Ironbark	542489	6798551	1010	3.18	No collar
26.5.17	DR & SR	C123	Grey Ironbark	542497	6798519	788	2.47	No collar
26.5.17	DR & SR	C124	Forest oak	542499	6798515	420	1.32	No collar
26.5.17	DR & SR	C125	White mahogany	542498	6798518	425	1.34	No collar
26.5.17	DR & SR	C125.1				428	1.34	No collar
26.5.17	DR & SR	C126	White mahogany	542498	6798531	679	2.13	No collar
26.5.17	DR & SR	C127	Camphor Laurel	542508	6798555	305	0.96	Phase 2
26.5.17	DR & SR	C127.1				230	0.72	Phase 2
26.5.17	DR & SR	C127.2				190	0.6	Phase 2
26.5.17	DR & SR	C128	Tuckeroo	542511	6798544	399	1.25	Phase 2
26.5.17	DR & SR	C129	Camphor Laurel	542514	6798544	335	1.06	Phase 2
26.5.17	DR & SR	C129.1				280	0.88	No collar
26.5.17	DR & SR	C129.2				178	0.56	No collar
26.5.17	DR & SR	C130	White mahogany	542521	6798537	381	1.2	Phase 2

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
26.5.17	DR & SR	C131	Pink bloodwood	542513	6798523	620	1.94	Phase 2
26.5.17	DR & SR	C131.1				354	1.11	Phase 2
26.5.17	DR & SR	C131.2				283	0.89	Phase 2
26.5.17	DR & SR	C132	White mahogany	542513	6798515	685	2.15	No collar
26.5.17	DR & SR	C133	White mahogany	542514	6798510	634	2	No collar
26.5.17	DR & SR	C134	White bottlebrush	542523	6798506	576	1.81	Phase 2
26.5.17	DR & SR	C135	Broad-leaved paperbark	542531	6798517	700	2.16	Phase 2
26.5.17	DR & SR	C136	Broad-leaved paperbark	542537	6798519	420	1.32	Phase 2
26.5.17	DR & SR	C137	Pink bloodwood	542526	6798530	489	1.54	Phase 2
26.5.17	DR & SR	C138	Broad-leaved paperbark	542537	6798525	392	1.23	Phase 2
26.5.17	DR & SR	C139	broad-leaved paperbark	542539	6798524	490	1.54	Phase 2
		C139.1				328	1.03	Phase 2
26.5.17	DR & SR	C140	broad-leaved paperbark	542542	6798524	387	1.22	Phase 2
26.5.17	DR & SR	C141	Broad-leaved paperbark	542542	6798517	353	1.11	No collar
26.5.17	DR & SR	C142	Broad-leaved paperbark	542538	6798519	233	0.74	Phase 2
26.5.17	DR & SR	C143	Broad-leaved paperbark	542538	6798519	243	0.77	Phase 2
26.5.17	DR & SR	C144	Broad-leaved paperbark	542545	6798514	330	1.04	Phase 2
26.5.17	DR & SR	C145	Broad-leaved paperbark	542539	6798515	430	1.35	Phase 2
26.5.17	DR & SR	C146	Broad-leaved paperbark	542541	6798520	310	0.98	Phase 2
26.5.17	DR & SR	C147	Broad-leaved paperbark	542542	6798524	290	0.92	Phase 2
26.5.17	DR & SR	C148	Broad-leaved paperbark	542542	679853	238	0.75	Phase 2
26.5.17	DR & SR	C149	Broad-leaved paperbark	542541	6798525	302	0.95	Phase 2
26.5.17	DR & SR	C150	Broad-leaved paperbark	542549	6798524	320	1.01	Phase 2
26.5.17	DR & SR	C151	Broad-leaved paperbark	542549	6798522	435	1.37	Phase 2
26.5.17	DR & SR	C152	Broad-leaved paperbark	542549	6798523	330	1.04	Phase 2
26.5.17	DR & SR	C153	Broad-leaved paperbark	542551	6798521	257	0.81	Phase 2
26.5.17	DR & SR	C154	Broad-leaved paperbark	542555	6798523	484	1.52	Phase 2
26.5.17	DR & SR	C155	Pink bloodwood	542566	6798526	423	1.33	Phase 2
27.5.17	DR & ZE	C156	Forest red gum	542756	6798494	285	0.9	No collar
27.5.17	DR & ZE	C156.1				280	0.87	No collar
27.5.17	DR & ZE	C156.2				225	0.72	No collar
27.5.17	DR & ZE	C157	Liquid amber	542744	6798511	166	0.54	No collar
27.5.17	DR & ZE	C157.1				185	0.59	No collar
27.5.17	DR & ZE	C158	Liquid amber	542748	6798513	728	2.28	No collar
27.5.17	DR & ZE	C159	Forest red gum	542738	6798521	242	0.76	No collar
27.5.17	DR & ZE	C159.1				180	0.57	No collar
27.5.17	DR & ZE	C160	Forest red gum	542746	6798535	1043	4.5	No collar
27.5.17	DR & ZE	C161	Forest red gum	542731	6798533	245	0.76	No collar
27.5.17	DR & ZE	C162	Blueberry ash	542731	6798535	231	0.73	No collar
27.5.17	DR & ZE	C163	Silky oak	542747	6798548	308	0.97	No collar
27.5.17	DR & ZE	C164	Forest red gum	542652	6798673	208	0.66	No collar
27.5.17	DR & ZE	C164.1				203	0.63	No collar
27.5.17	DR & ZE	C165	Forest red gum	542660	6798659	160	0.51	No collar
27.5.17	DR & ZE	C166	Forest red gum	542662	6798659	136	0.43	No collar
27.5.17	DR & ZE	C167	Forest red gum	542642	6798824	430	1.36	Phase 2
27.5.17	DR & ZE	C168	Forest red gum	542644	6798833	367	1.16	Phase 2

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
27.5.17	DR & ZE	C169	Swamp mahogany	542622	6798822	287	0.91	Phase 2
27.5.17	DR & ZE	C170	Swamp mahogany	542626	6798827	340	1.07	Phase 2
27.5.17	DR & ZE	C171	Forest red gum	542612	6798830	795	2.5	No collar
27.5.17	DR & ZE	C172	Lilly pilly	542619	6798826	485	1.53	No collar
27.5.17	DR & ZE	C173	Forest red gum	542618	6798826	720	2.26	No collar
27.5.17	DR & ZE	C174	Forest red gum	542624	6798827	723	2.27	Phase 2
27.5.17	DR & ZE	C175	Forest red gum	542611	6798835	408	1.28	No collar
27.5.17	DR & ZE	C176	Forest red gum	542607	6798844	530	1.67	No collar
27.5.17	DR & ZE	C177	Hoop pine	542605	6798862	900	2.82	No collar
27.5.17	DR & ZE	C178	Forest red gum	542619	6798847	560	1.76	No collar
27.5.17	DR & ZE	C179	Forest red gum	542625	6798878	465	1.46	Phase 2
27.5.17	DR & ZE	C180	Cabbage palm	542622	6798880	315	0.99	Phase 2
27.5.17	DR & ZE	C181	Broad-leaved paperbark	542692	6798832	290	0.91	No collar
27.5.17	DR & ZE	C181.1				345	1.09	No collar
27.5.17	DR & ZE	C182	Broad-leaved paperbark	542687	6798842	497	1.55	No collar
27.5.17	DR & ZE	C183	Broad-leaved paperbark	542688	6798842	185	0.59	No collar
27.5.17	DR & ZE	C183.1				220	0.7	No collar
27.5.17	DR & ZE	C183.2				204	0.64	No collar
27.5.17	DR & ZE	C184	Broad-leaved paperbark	542692	6798841	233	0.7	No collar
27.5.17	DR & ZE	C184.1				297	0.93	No collar
27.5.17	DR & ZE	C184.2				277	0.87	No collar
27.5.17	DR & ZE	C185	Swamp oak	542695	6798840	230	0.72	No collar
27.5.17	DR & ZE	C185.1				274	0.87	No collar
27.5.17	DR & ZE	C185.2				370	1.16	No collar
27.5.17	DR & ZE	C186	Swamp oak	542690	6798841	394	1.24	No collar
27.5.17	DR & ZE	C187	Swamp oak	542690	6798850	335	1.04	No collar
27.5.17	DR & ZE	C188	Swamp oak	542692	6798867	352	1.1	No collar
27.5.17	DR & ZE	C189	Swamp oak	542699	6798870	565	1.78	No collar
27.5.17	DR & ZE	C190	Swamp oak	542698	6798881	413	1.3	No collar
27.5.17	DR & ZE	C191	Swamp oak	542704	6798878	510	1.6	No collar
27.5.17	DR & ZE	C192	Broad-leaved paperbark	542698	6798884	390	1.23	No collar
27.5.17	DR & ZE	C193	Broad-leaved paperbark	542705	6798895	340	1.23	No collar
27.5.17	DR & ZE	C193.1				170	0.55	No collar
27.5.17	DR & ZE	C193.2				189	0.59	No collar
27.5.17	DR & ZE	C194	Broad-leaved paperbark	542706	6798891	330	1.04	No collar
27.5.17	DR & ZE	C195	Broad-leaved paperbark	542709	6798896	518	1.63	No collar
27.5.17	DR & ZE	C195.1				408	1.28	No collar
27.5.17	DR & ZE	C196	Broad-leaved paperbark	542706	6798901	510	1.6	No collar
27.5.17	DR & ZE	C197	Swamp oak	542722	6798897	317	1	No collar
27.5.17	DR & ZE	C198	Broad-leaved paperbark	542725	6798904	330	1.04	No collar
27.5.17	DR & ZE	C199	Swamp oak	542726	6798911	355	1.12	No collar
27.5.17	DR & ZE	C200	Swamp oak	542725	6798906	295	0.93	No collar
27.5.17	DR & ZE	C201	Broad- leaved paperbark	542722	6798910	380	1.2	No collar
27.5.17	DR & ZE	C202	Swamp oak	542723	6798919	372	1.16	No collar
27.5.17	DR & ZE	C203	Swamp oak	542715	6798923	397	1.25	No collar
27.5.17	DR & ZE	C204	Broad-leaved paperbark	542729	6798909	295	0.95	No collar

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
27.5.17	DR & ZE	C205	Swamp oak	542730	6798917	456	1.44	No collar
27.5.17	DR & ZE	C206	Broad-leaved paperbark	542734	6798923	345	1.08	No collar
27.5.17	DR & ZE	C207	Swamp oak	542726	6798927	340	1.07	No collar
27.5.17	DR & ZE	C208	Swamp oak	542729	6798931	343	1.08	No collar
27.5.17	DR & ZE	C208.1				390	1.22	No collar
27.5.17	DR & ZE	C208.2				399	1.25	No collar
27.5.17	DR & ZE	C209	Broad-leaved paperbark	542734	6798931	300	0.95	No collar
27.5.17	DR & ZE	C209.1				235	0.74	No collar
27.5.17	DR & ZE	C210	Broad-leaved paperbark	542741	6798931	280	0.87	No collar
27.5.17	DR & ZE	C211	Swamp oak	542743	6798925	323	1.02	No collar
27.5.17	DR & ZE	C212	Broad-leaved Paperbark	542729	6798935	390	1.22	No collar
27.5.17	DR & ZE	C212.1				300	0.95	No collar
27.5.17	DR & ZE	C212.2				225	0.71	No collar
27.5.17	DR & ZE	C213	Broad-leaved paperbark	542731	6798937	380	1.2	No collar
27.5.17	DR & ZE	C213.1				330	1.04	No collar
27.5.17	DR & ZE	C214	Broad-leaved paperbark	542730	6798949	250	0.78	No collar
27.5.17	DR & ZE	C214.1				148	0.48	No collar
27.5.17	DR & ZE	C214.2				180	0.57	No collar
27.5.17	DR & ZE	C214.3				340	1.08	No collar
27.5.17	DR & ZE	C214.4				144	0.45	No collar
27.5.17	DR & ZE	C215	Swamp oak	542703	6798949	170	0.54	No collar
27.5.17	DR & ZE	C215.1				340	1.06	No collar
27.5.17	DR & ZE	C215.2				263	0.83	No collar
27.5.17	DR & ZE	C215.3				210	0.67	No collar
27.5.17	DR & ZE	C216	Hoop pine	542703	6798952	320	1	No collar
27.5.17	DR & ZE	C217	Swamp oak	542682	6798954	299	0.95	Phase 2
27.5.17	DR & ZE	C218	Swamp oak	542675	6798953	344	1.09	Phase 2
27.5.17	DR & ZE	C219	Swamp oak	542673	6798958	274	0.86	Phase 2
27.5.17	DR & ZE	C220	Swamp oak	542673	6798958	375	1.18	Phase 2
27.5.17	DR & ZE	C221	Swamp oak	542670	6798957	338	1.07	No collar
27.5.17	DR & ZE	C222	Swamp oak	542666	6798958	334	1.05	No collar
27.5.17	DR & ZE	C223	Swamp oak	542666	6798960	300	0.94	No collar
27.5.17	DR & ZE	C224	Swamp oak	542707	6798982	321	0.98	No collar
27.5.17	DR & ZE	C225	Swamp oak	542715	6798984	350	1.1	Phase 2
27.5.17	DR & ZE	C226	Swamp oak	542721	6798982	300	0.95	Phase 2
27.5.17	DR & ZE	C227	Swamp oak	542721	6798979	350	1.1	No collar
27.5.17	DR & ZE	C227.1				228	0.72	No collar
27.5.17	DR & ZE	C227.2				250	0.79	No collar
27.5.17	DR & ZE	C228	Swamp oak	542726	6798977	350	1.09	No collar
27.5.17	DR & ZE	C229	Forest red gum	542715	6798955	388	1.25	No collar
27.5.17	DR & ZE	C230	Forest red gum	542715	6798954	572	1.8	No collar
27.5.17	DR & ZE	C231	Swamp oak	542741	6798979	414	1.3	No collar
27.5.17	DR & ZE	C232	Swamp oak	542737	6798984	317	1	No collar
27.5.17	DR & ZE	C233	Swamp oak	542720	6799003	297	0.93	No collar
27.5.17	DR & ZE	C233.1				260	0.81	No collar
27.5.17	DR & ZE	C234	Swamp oak	542717	6799001	307	0.96	No collar

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
27.5.17	DR & ZE	C234.1				224	0.7	No collar
27.5.17	DR & ZE	C235	Swamp oak	542700	6799008	290	0.91	Phase 2
27.5.17	DR & ZE	C236	Swamp oak	542684	6799011	345	1.1	No collar
27.5.17	DR & ZE	C236.1				275	0.87	No collar
27.5.17	DR & ZE	C237	Black wattle	542749	6799072	542	1.7	No collar
27.5.17	DR & ZE	C238	Swamp oak	542740	6799083	354	1.11	No collar
27.5.17	DR & ZE	C239	Swamp oak	542740	6799082	355	1.11	Phase 2
27.5.17	DR & ZE	C240	Swamp oak	542740	6799084	345	1.09	Phase 2
27.5.17	DR & ZE	C241	Swamp oak	542739	6799086	284	0.89	Phase 2
27.5.17	DR & ZE	C242	Black wattle	542728	6799087	294	0.92	Phase 2
27.5.17	DR & ZE	C243	Sieber's paperbark	542774	6799090	437	1.37	No collar
27.5.17	DR & ZE	C244	White bottlebrush	542769	6799089	350	1.1	No collar
27.5.17	DR & ZE	C245	Camphor Laurel	542792	6799244	480	1.51	No collar
27.5.17	DR & ZE	C246	Broad-leaved paperbark	542790	6799248	312	0.98	No collar
27.5.17	DR & ZE	C247	Broad-leaved paperbark	542748	6799250	295	0.92	Phase 2
27.5.17	DR & ZE	C247.1				200	0.63	Phase 2
27.5.17	DR & ZE	C248	Broad-leaved paperbark	542780	6799255	645	2.03	No collar
27.5.17	DR & ZE	C248.1				485	1.51	No collar
27.5.17	DR & ZE	C249	Broad-leaved paperbark	542778	6799260	978	3.06	Phase 2
27.5.17	DR & ZE	C250	Broad-leaved paperbark	542775	6799256	770	2.42	Phase 2
27.5.17	DR & ZE	C251	Broad-leaved paperbark	542754	6799252	1097	3.45	Phase 2
27.5.17	DR & ZE	C252	Forest red gum	542787	6799354	468	1.47	No collar
27.5.17	DR & ZE	C253	Broad-leaved paperbark	542827	6799346	430	1.35	Phase 2
27.5.17	DR & ZE	C253.1				345	1.09	Phase 2
27.5.17	DR & ZE	C253.2				362	1.14	Phase 2
27.5.17	DR & ZE	C254	Broad-leaved paperbark	542826	6799348	400	1.25	Phase 2
27.5.17	DR & ZE	C254.1				300	0.93	Phase 2
27.5.17	DR & ZE	C255	Broad-leaved paperbark	542825	6799342	310	0.98	Phase 2
27.5.17	DR & ZE	C255.1				450	1.4	Phase 2
27.5.17	DR & ZE	C255.2				435	1.36	Phase 2
27.5.17	DR & ZE	C256	Broad-leaved paperbark	542827	6799348	302	0.95	Phase 2
27.5.17	DR & ZE	C257	Black wattle	542827	6799340	270	0.85	Phase 2
27.5.17	DR & ZE	C258	Broad-leaved paperbark	542826	6799353	680	2.14	Phase 2
27.5.17	DR & ZE	C259	Broad-leaved paperbark	542833	6799349	780	2.46	Phase 2
27.5.17	DR & ZE	C260	Forest red gum	542866	6799360	454	1.43	No collar
27.5.17	DR & ZE	C261	Forest red gum	542793	6799365	571	1.79	No collar
27.5.17	DR & ZE	C262	Forest red gum	542805	6799362	549	1.73	No collar
27.5.17	DR & ZE	C263	Forest red gum	542795	6799363	333	1.05	No collar
27.5.17	DR & ZE	C264	Forest red gum	542798	6799361	394	1.24	No collar
27.5.17	DR & ZE	C265	Forest red gum	542791	6799364	313	0.98	No collar
27.5.17	DR & ZE	C266	Forest red gum	542789	6799364	327	1.03	No collar
27.5.17	DR & ZE	C267	Forest red gum	542789	6799362	284	0.89	No collar
27.5.17	DR & ZE	C268	Forest red gum	542793	6799364	417	1.31	No collar
27.5.17	DR & ZE	C269	Forest red gum	542786	6799363	193	0.61	No collar
12.7.17	GM & SR	C270	Hoop pine	542537	6798939	725	2.28	No collar
12.7.17	GM & SR	C271	Hoop pine	542532	6798931	982	3.08	No collar

Date	Observer	Tree number	Species	Easting	Northing	DBH (mm)	Circumf (m)	Collar Status
12.7.17	GM & SR	C272	Hoop pine	542578	6798959	922	2.9	No collar
12.7.17	GM & SR	C273	Hoop pine	542580	6798927	1045	3.28	No collar
12.7.17	GM & SR	C274	Hoop pine	542595	6798926	530	1.66	No collar
12.7.17	GM & SR	C274.1				295	0.94	No collar
12.7.17	GM & SR	C275	Hoop pine	542605	6798959	907	2.85	No collar
12.7.17	GM & SR	C276	Blackbutt	542564	6798890	694	2.18	No collar
12.7.17	GM & SR	C277	Broad-leaved paperbark	542543	6798878	382	1.2	No collar
12.7.17	GM & SR	C277.1				460	1.4	No collar
12.7.17	GM & SR	C277.2				384	1.2	No collar
12.7.17	GM & SR	C278	Tallowwood	542555	6798882	595	1.87	No collar
12.7.17	GM & SR	C279	Hoop pine	542559	6798873	703	2.21	No collar
12.7.17	GM & SR	C280	Hoop pine	542568	6798868	490	1.94	No collar
12.7.17	GM & SR	C280.1				410	1.28	No collar
12.7.17	GM & SR	C280.2				552	1.74	No collar
12.7.17	GM & SR	C281	Lemon-scented gum	542573	6798859	630	1.98	No collar
12.7.17	GM & SR	C282	Broad-leaved paperbark	542571	6798841	485	1.52	No collar
12.7.17	GM & SR	C282.1				188	0.6	No collar
12.7.17	GM & SR	C283	Hoop pine	542577	6798874	896	2.81	No collar
12.7.17	GM & SR	C284	Ficus sp.	542586	6798863	327	1.03	Phase 2
12.7.17	GM & SR	C284.1				340	1.07	No collar
12.7.17	GM & SR	C284.2				300	0.94	No collar
12.7.17	GM & SR	C284.3				430	1.35	No collar
19.7.17	BT & ZE	C285	Hoop pine	542588	6798775	530.00	1.65	No collar
19.7.17	BT & ZE	C285.1	Hoop pine			615.00	1.94	No collar
19.7.17	BT & ZE	C286	Hoop pine	542584	6798787	700.00	2.20	No collar
19.7.17	BT & ZE	C287	Hoop Pine	542584	6798787	465.00	1.46	No collar
19.7.17	BT & ZE	C288	Forest red gum	542574	6798780	350.00	1.10	No collar
19.7.17	BT & ZE	C289	Flooded gum	542574	6798780	350.00	1.10	No collar
19.7.17	BT & ZE	C290	Spotted gum	542579	6798785	345.00	1.10	No collar
19.7.17	BT & ZE	C291	Swamp oak	542579	6798785	291.00	0.90	No collar
19.7.17	BT & ZE	C292	Swamp oak	542567	6798789	295.00	0.94	No collar
19.7.17	BT & ZE	C293	Swamp oak	542569	6798819	338.00	1.05	No collar
19.7.17	BT & ZE	C294	Swamp oak	542561	6798817	415.00	1.31	No collar
19.7.17	BT & ZE	C295	Swamp oak	542556	6798819	373.00	1.17	No collar
19.7.17	BT & ZE	C296	Flooded gum	542556	6798819	450.00	1.41	No collar
19.7.17	BT & ZE	C297	Tipuana tipu	542541	6798819	582.00	1.83	No collar
18.7.17	BT & ZE	Add	Stag	NR	NR	NR	NR	Phase 2
18.7.17	BT & ZE	Add	Stag	NR	NR	NR	NR	Phase 2
2.8.17	DR & ZE	C298	Forest red gum	542588	6798836	260	NR	No Collar

Table A2: Habitat trees identified in the Wardell Road study area. s = small (10-50mm); m = medium (51-150mm); l = large (151-300mm); vl = very large (>300mm).

Tree no.	Tree Species	Easting	Northing	DBH (m)	Circumf (m)	Branch	Trunk	Spout	Collar status
H1	Cypress pine	542342	6798306	0.66	2.09		1m		No collar
H2	White mahogany	542306	6798537	1.26	3.95	1m, 1s	1l		No collar
H3	White mahogany	542337	6798519	0.79	2.48		1m		No collar
H4	White mahogany	542495	6798537	1.07	3.37	1s, 4m	2s, 2m		Phase 2
H5	White mahogany	542509	6798546	0.42	1.31	1s	2s		No collar
H6	Forest red gum	542677	6798675	1.00	3.14	1s	1term		No collar
H7	Forest Red Gum	542714	6798662	1.30	4.08	2s, 2m			No collar

Table A3: Weather conditions during Phase 2 koala population surveys at the Wardell Road hotspot. Mlb = moves large branch; Msb = moves small branch.

Date	Survey No.	Observers	Start	End	Temp Range	Cloud %	Wind	Rain	Moon	Comments
30/5/2017	1-N	BT, NP, SR	1730	2056	14-17	10	Nil	Fine	1/4	
31/5/2017	1-D	NP, SR, MJ	1202	1530	16-19	nil	Mlb	Fine	1/4	
5/6/2017	2-N	BT, GM, SR	1722	2059	12-16	15	Msb	Fine	2/4	
6/6/2017	2-D	BT, GM, DR	0927	1308	17-20	10	Msb	Fine	2/4	
3/07/2017	3N	NP, GM, SR	1725	2115	17-19	10-80	MLB	Fine	2/4	Fine, then light shower.
4/07/2017	3D	GM, SR, ZE	945	1330	21-22	0	Nil	Fine	N/A	
26/7/17	4N	BT MJ SJ	1730	2055	14-17	0	Msb	Fine	2/4	
27/7/17	4D	BT MJ SJ	941	1248	28-20	0	Msb	Fine	2/4	

Table A4: Koala scat collection location data. HZMT = Hazlemount Lane.

Collection Date	Record No.	Impact/Control	Time	T'sect/Location	Easting	Northing	Tree sp.	Collection Type
31/5/2017	WK1	I		1	542533	6798776	Forest red gum	Off ground
2/6/2017	WC1	C	915	HZMT	531901	6798489	Tallowwood	Off ground
6/6/2017	WK2	I	1325	1	542533	6798776	Forest red gum	Off ground
6/6/2017	WK3	I	1325	1	542569	6798777	Forest red gum	Off ground
6/6/2017	WC2	C	830	HZMT	532008	6799069	Flooded gum	Off ground
6/6/2017	WC3	C	900	HZMT	531891	6798479	Flooded gum	Off ground
4/07/2017	WK4	I	1345	1	542549	6798784	Narrow-leaved red gum	Off ground
5/07/2017	WC4	C	735	HZMT	531904	6798512	Forest red gum	Off ground
27/07/17	WK5	I	1320	7	542763	6798531	Forest red gum	Off ground
28/07/17	WC5	C	900	HZMT	531915	6798549	Swamp mahogany	Off ground

Table A5: Koala scat collection weather and health data. HZMT = Hazlemount Lane.

T'sect/Location	DBH	Temp at collection	Weather at collection	Rainfall (collection period)	Sex	Breeding	Health	Comments (activity; ear tag?)
1	600		Fine	Nil	M?	No	Healthy	
HZMT	450	12	Fine	Nil	M	No	Healthy	Large male, healthy
1	600	20.5	Fine	Nil	F?	No	Wet, stained	
1	300	20.5	Fine	Nil	M?	No	Wet, stained	
HZMT	300	12	Fine	Nil	M?	?	Dry	
HZMT	380	14	Fine	Nil	M?	?	Dry	
1	600	24	Fine	Nil	M?	?	Stained	
HZMT	650	9	Fine	Nil	F?	?	Healthy	
7	1400	19	fine	nil	F?	?	Dirty bum	
HZMT	500	9	fine	nil	F?	?	Dirty bum	