Biennial Monitoring Report – 2022

Bruce Highway (Cooroy to Curra) Section D – Commonwealth Offset Delivery

Department of Transport and Main Roads

16 September 2022

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1. Introduction

On 20 April 2020, the Department of Transport and Main Roads (TMR) received final conditions of approval (EPBC 2017/7941) from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DoCCEEW) (Formerly Department of Agriculture, Water and the Environment (DAWE)) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the Bruce Highway Cooroy to Curra Section D (Woondum to Curra) project ('the project').

Approval conditions required the delivery of offsets for the following matters of national environmental significance (MNES) that were significantly impacted by the project:

– Koala (*Phascolarctos cinereus*) - vulnerable under the EPBC Act and the Queensland *Nature Conservation Act 1992* (NC Act) at the time of referral. The koala has recently been up-listed as endangered under both the EPBC Act and NC Act.
– Black-breasted button-quail (*Turnix melanogaster*) – vulnerable under the EPBC Act and the NC Act.

Conditions relevant to this report are outlined in Table 1.1 below, with Condition 9 outlining the magnitude of offsets required for the koala and black-breasted button-quail and Condition 12 outlining the requirement to maintain and improve the quality of habitat for both species within the offset areas.

Table 1.1 Relevant Conditions under EPBC2017/7941

Condition No.	Condition
Condition 9	*To compensate for the loss of 135.83 hectares of Koala habitat and 8.08 hectares of Black-breasted Button-quail habitat, the approval holder must, prior to commencement, legally secure a minimum of 283.91 hectares at the Koala offset areas and 32.15 hectares at the Black-breasted Button-quail offset area.*
Condition 12	*The approval holder must:* *a. for the duration of the approval, ensure no net loss in the quality and extent of Black-breasted Button-quail habitat and the Koala habitat within the Koala offset areas and Black-breasted Button-quail offset area compared to the baseline survey data reported under* ***condition 11.a;*** *b. within 12 months of legally securing the Koala offset areas, commence implementation of an ongoing Koala food tree replanting program in the Koala offset areas. The replanting program must be undertaken by a suitably qualified person and include measures to ensure the maintenance and survival of new Koala food trees in the Koala offset areas.* *c. within 15 years of legally securing the Koala offset areas, the approval holder must demonstrate a 20% increase in Koala food tree recruitment over the entire Koala offset areas compared to the baseline survey results reported under condition 11.a;* *d. demonstrate the following reductions in weed infestation compared to the baseline data reported under condition 11.a:* *i. 50% reduction within 3 years of legally securing the Koala offset areas and Black-breasted Button-quail offset area;* *ii. 90% reduction within 10 years of legally securing the Koala offset areas and Black-breasted Button-quail offset area.* *e. Within 15 years of legally securing the Koala offset areas, demonstrate that an increase of at least 50% of Koala density has been achieved across the entire Koala offset areas compared to the baseline data reported under condition 11.a. To determine progress towards this outcome, Koala density surveys must be undertaken across the entire Koala offset areas by a suitably qualified person within 5 and 10 years respectively of legally securing the Koala offset areas. Contingency measures must be implemented to increase Koala density across the entire Koala offset areas where the results of these surveys indicate minimal increases in Koala density;* *f. demonstrate a reduction, maintained for 10 consecutive years from legally securing the Koala offset areas and Black-breasted Button-quail offset area, in pest abundance compared to the baseline data reported under condition 11.a;* *g. report to the Department, as part of Annual Compliance Reporting required under condition 20, matters required under condition l1.b and progress towards and achievement of the outcome milestones specified in condition 12.*

In 2021 an Offset Management Plan (OMP) was prepared to guide the delivery and compliance of offset requirements for the koala and black-breasted button quail. The OMP required biennial monitoring and reporting to assess compliance with Condition 12. This report represents the first Biennial Monitoring Report.

1.1 Purpose of this report

This Biennial Monitoring Report has been prepared to comply with Condition 12 while presenting results of surveys detailed in Condition 10 of the EPBC 2017/7941 approval requirements. This report has been prepared to present on the survey outcomes of the Year 1 biennial monitoring event required as per Section 4.4.4 (koala) and Section 5.4.4 (black-breasted button-quail) of the OMP. The following elements were required to be monitored biennially to progress towards achieving the conditioned ecological outcomes for the koala and black-breasted button-quail:

– Quality of koala habitat through site condition, site context and species stocking rates
– Koala density
– Black-breasted button-quail presence
– Pest abundance (not included within this report)
– Weed infestation
– Active management areas including revegetation areas, targeted naturally regenerating areas, weed management areas and land-use access management areas.

This report will be provided to DoCCEEW as part of Annual Compliance Reporting for 2022 - 23.

1.2 Scope and limitations

This report has been prepared by GHD for TMR and may only be used and relied on by TMR for the purpose agreed between GHD and the TMR as set out in Section 1.1 of this report.

GHD otherwise disclaims responsibility to any person other than TMR arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of vegetation, weeds or fauna. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

1.3 Suitably qualified personnel

Condition 10 of the EPBC 2017/7941 approval requirements requires the baseline surveys to be conducted by a suitably qualified person (SQP) in accordance with the following Commonwealth survey guidelines:

– Survey guidelines for Australia's threatened birds (DAWE, 2017)
– Survey Guidelines for Australia's threatened mammals (DAWE, 2011)
– Further information on the guidelines used to inform the methodology is detailed in Section 3.

Within the definitions of EPBC 2017/7941, a suitably qualified person for this project is defined as:

– A person who has professional qualifications, training, skills and at least three years of relevant experience specific to locating, identifying and conserving the black-breasted button-quail. The SQP must be able to give authoritative independent assessment, advice and analysis specific to the black-breasted button-quail using the relevant protocols, standards, methods and/or literature. Where the person does not have the appropriate professional qualifications, they must have at least five years of relevant experience specific to the black-breasted button-quail.
– A person who has professional qualifications, training, skills and at least three years of relevant experience specific to locating, identifying and conserving the koala. The SQP must be able to give authoritative independent assessment, advice and analysis specific to the koala using the relevant protocols, standards, methods and/or literature. Where the person does not have the appropriate professional qualifications, they must have at least five years of relevant experience specific to the koala**.**

In order to comply with Condition 10, Dr Simon Hodgkison designed, lead and provided technical input into this report. Dr Simon Hodgkison's' qualifications and skills are presented below:

Dr Simon Hodgkison **SQP Senior Fauna Ecologist**

Simon is a fauna ecologist with more than 18 years' experience in ecological research and baseline ecological and impact assessment. Areas of special expertise include the survey and monitoring of birds, reptiles, mammals and frogs. Simon has a wealth of local fauna survey experience, having been the lead fauna ecologist for various targeted surveys, impact assessment, management and monitoring programs for the koala and black-breasted button-quail He has lead ecology teams for GHD projects across the Sunshine Coast, and TMR linear infrastructure projects. Simon has considerable experience in the design and monitoring of fauna crossing infrastructure on projects including the Cooroy to Curra Sections A, C and D, Darra to Springfield Transport Corridor, Mt Cotton Road Upgrade, Logan Enhancement Project and Yarrabilba Ecological Corridors Project.

2. Overview of offset areas

2.1 Offset areas summary

Offset areas occur within a total of 13 land parcels which have been legally secured in order to deliver the offset obligations for the project for the koala and/or black-breasted button-quail. Details of the property descriptions, ownership and areas for each of the MNES offset values are summarised in Table 2.1.

To enable an efficient and effective field program for the baseline assessment, the offset areas have been divided into three separate groups; northern, central and southern based on the geographical locations (Table 2.1).

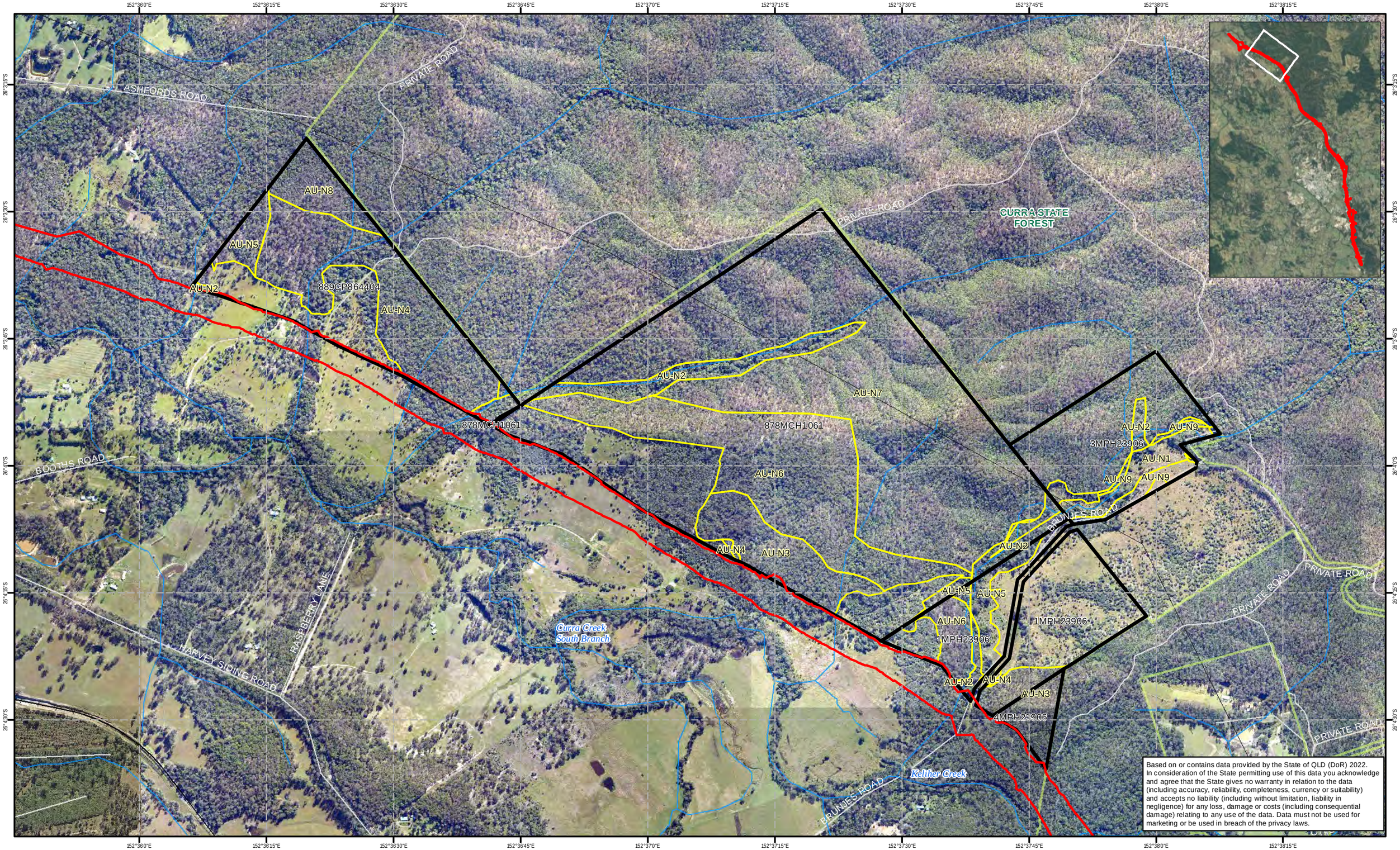
The koala and black-breasted button-quail offset areas are described in Table 2.1 and shown in Figure 2.1 and Figure 2.2, respectively. Individual assessment units (AU's) are detailed for each offset area.

Table 2.1 Summary of offset areas

Group	AUs	Offset area name	Lot on plan* Address*	Owner	Tenure	Offset area (ha)	Total area secured (ha)	Total lot area (ha)*
Koala								
South	S2, S4, S6	K-OA1	Lot 2 SP302526 93 Woondum Rd, Kybong	TMR	Freehold	**11.43**	15.20	40.71
South	S2, S3, S4, S5, S6	K-OA2	Lot 3 SP302524 95 Woondum Rd, Kybong	TMR	Freehold	**21.37**	28.25	34.59
South	S1, S2, S7	K-OA3	Lot 102 SP297908 Cnr Keefton Rd and Bruce Highway	TMR	Freehold	**12.38**	12.65	13.77
North	N3	K-OA4	Lot 4 MPH23906 139 Brunjes Rd, Curra	TMR	Freehold	**3.46**	3.46	15.67
North	N1, N2, N3, N4, N5, N6	K-OA5	Lot 1 MPH23906 1434 Harvey Siding Rd, Curra	TMR	Freehold	**9.96**	27.69	32.32
North	N1, N2, N7, N9	K-OA6	Lot 3 MPH23906 1434 Harvey Siding Rd, Curra	TMR	Freehold	**19.53**	22.97	22.99
North	N2, N3, N4, N5, N6, N7	K-OA7	Lot 878 MCH1061 62 Raspberry Lane, Curra	TMR	Freehold	**124.56**	144.56	198.09
North	N2, N4, N5, N8	K-OA8	Lot 889 CP864404 69 Booths Rd, Curra	TMR	Freehold	**33.09**	40.79	97.12
Central	C1, C2	K-OA9	Lot 1 MPH23904 Banks Pocket Rd, Araluen	GRC	Freehold	**5.86**	5.86	6.09
Central	C1, C2	K-OA10	Lot 1 MPH5670 Banks Pocket Rd, Araluen	GRC	Freehold	**2.02**	2.02	2.02
Central	C1	K-OA11	Lot 2 MPH14193 Banks Pocket Rd, Araluen	GRC	Freehold	**7.27**	7.27	7.32

Group	AUs	Offset area name	Lot on plan* Address*	Owner	Tenure	Offset area (ha)	Total area secured (ha)	Total lot area (ha)*
Central	C1	K-OA12	Lot 763 MCH5342 Banks Pocket Rd, Araluen	GRC	Freehold	**3.58**	3.58	3.58
Central	C1, C2	K-OA13	Lot 19 SP299683 15 Belvedere Rd, Veteran	GRC	Freehold	**26.09**	26.87	33.66
Koala offset area subtotals						**280.60**	341.17	507.93
TOTAL KOALA OFFSET AREA = Approx. 280.61 ha								
Black-breasted button-quail								
South	S2, S4, S6	BBBQ-OA1	Lot 2 SP302526 93 Woondum Rd, Kybong	TMR	Freehold	**13.63**	15.20	40.71
South	S4, S6	BBBQ-OA2	Lot 3 SP302524 95 Woondum Rd, Kybong	TMR	Freehold	**7.83**	28.25	34.59
South	S1, S2	BBBQ-OA3	Lot 102 SP297908 Cnr Keefton Rd and Bruce Highway, Kybong	TMR	Freehold	**11.22**	12.65	13.77
Black-breasted button-quail offset area subtotals						**32.68**	56.10	89.07
TOTAL BLACK-BREASTED BUTTON-QUAIL OFFSET AREA = Approx. 32.68 ha								

* Several addresses may change due to the intersection of the land parcel by the future road corridor; future resumptions may require new lot on plan numbers to be applied to these land parcels and total lot areas may change



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LEGEND

- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Koala Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Koala Offset Areas Northern Group

Job Number 12534030
Revision A
Date 01 Jun 2022

Figure 2-1

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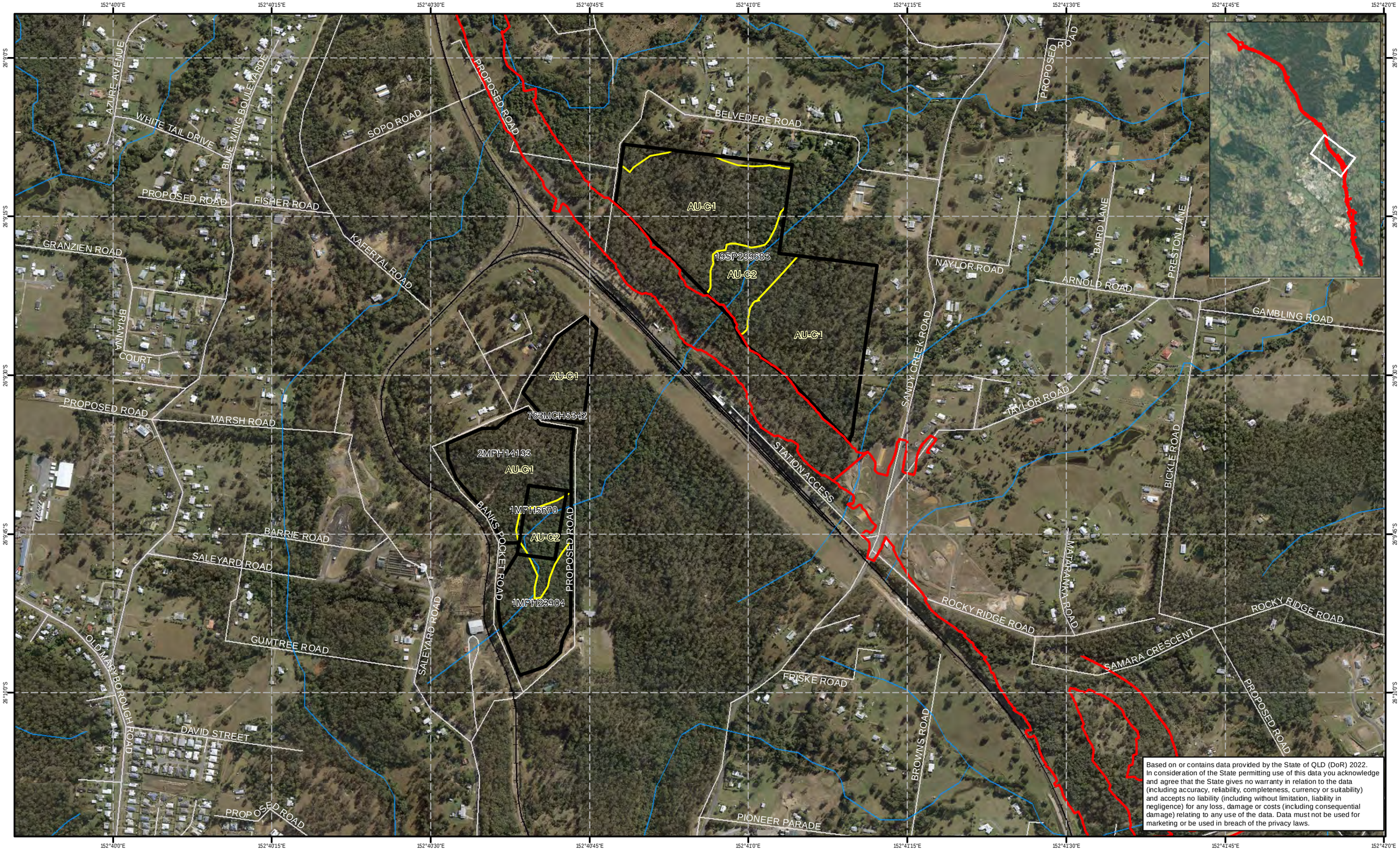

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Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Koala Offset Areas Central Group

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Figure 2-1
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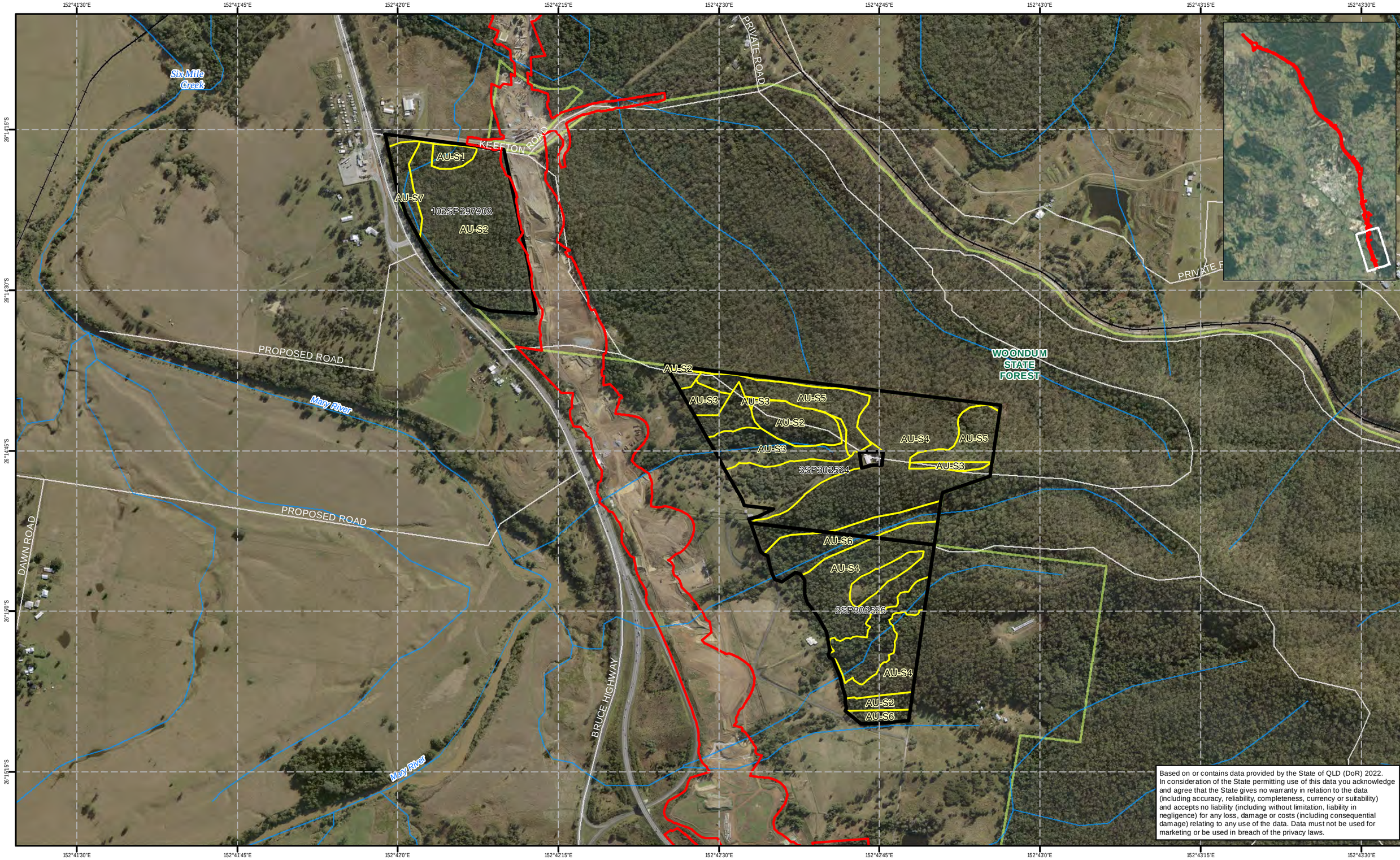

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LEGEND

- Watercourses
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- Koala Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Koala Offset Areas Southern Group

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Figure 2-1
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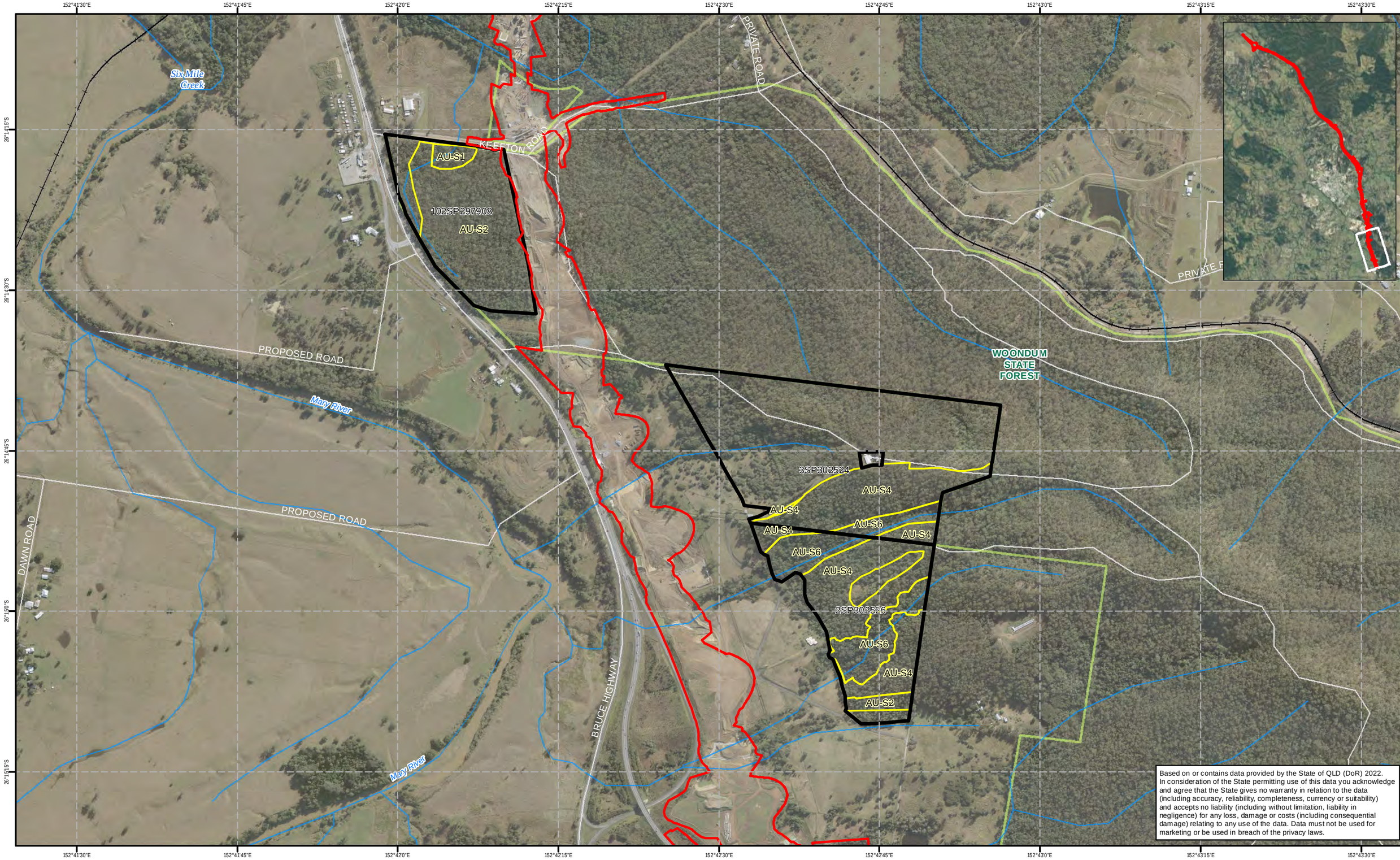

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LEGEND

- Watercourses
- Railway
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- Project Footprint
- State Forest
- Offset Areas
- BBBQ Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

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Black-breasted button quail offset areas Southern Group

Figure 2-2

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3. Monitoring methods

3.1 Monitoring survey overview

This represents the first biennial monitoring event since baseline surveys were completed in 2020. Monitoring was undertaken by three ecologists (Peter Moonie, Simon Hodgkison and Victoria Crepin) over two survey events in March 2022. Surveys were undertaken within each offset area to document the following in accordance with Condition 10 of the EPBC Act approval:

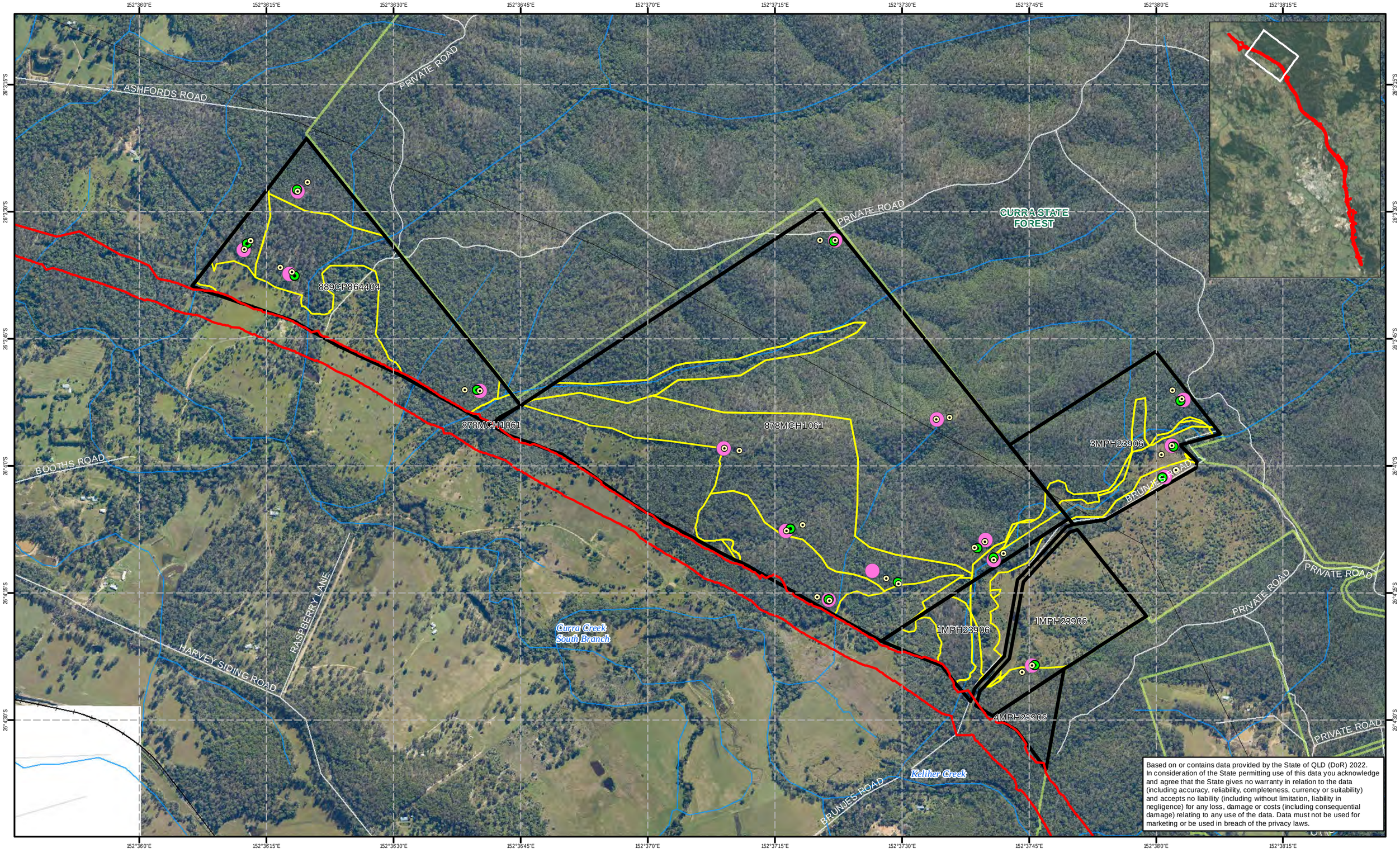
– The quality of habitat for the koala and black-breasted button-quail
– Weed infestation
– Koala density
– Black-breasted button-quail presence.

Further details on the requirements of each assessment category are provided within the following sections. The surveys undertaken in each survey event are detailed in Table 3.1.

The survey sites for koala are shown in Figure 3.1, while the survey sites for black-breasted button-quail are shown in Figure 3.2. Locations of weed control monitoring sites are shown in Figure 3.3.

Table 3.1 Monitoring surveys

Survey date	Activities undertaken
28 March – 1 April 2022	BioCondition / Habitat quality surveys Habitat surveys for koala and black-breasted button-quail Targeted searches for koala pellets and black-breasted button-quail (8 person hours – 2 people x 2 hours x 2 days) Setting remote surveillance cameras
3 – 8 April 2022	Weed surveys
May and June 2022	Thermal drone operators and koala researchers from the University of Sunshine Coast (USC) undertook targeted drone surveys for koalas within the offset areas over 20 days between May 2022 and June 2022.



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- Bio-condition Survey Point
- Transect Waypoint
- Koala Survey Site
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Lots
- Koala Assessment Units

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Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Koala survey sites Northern Group

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Figure 3-1
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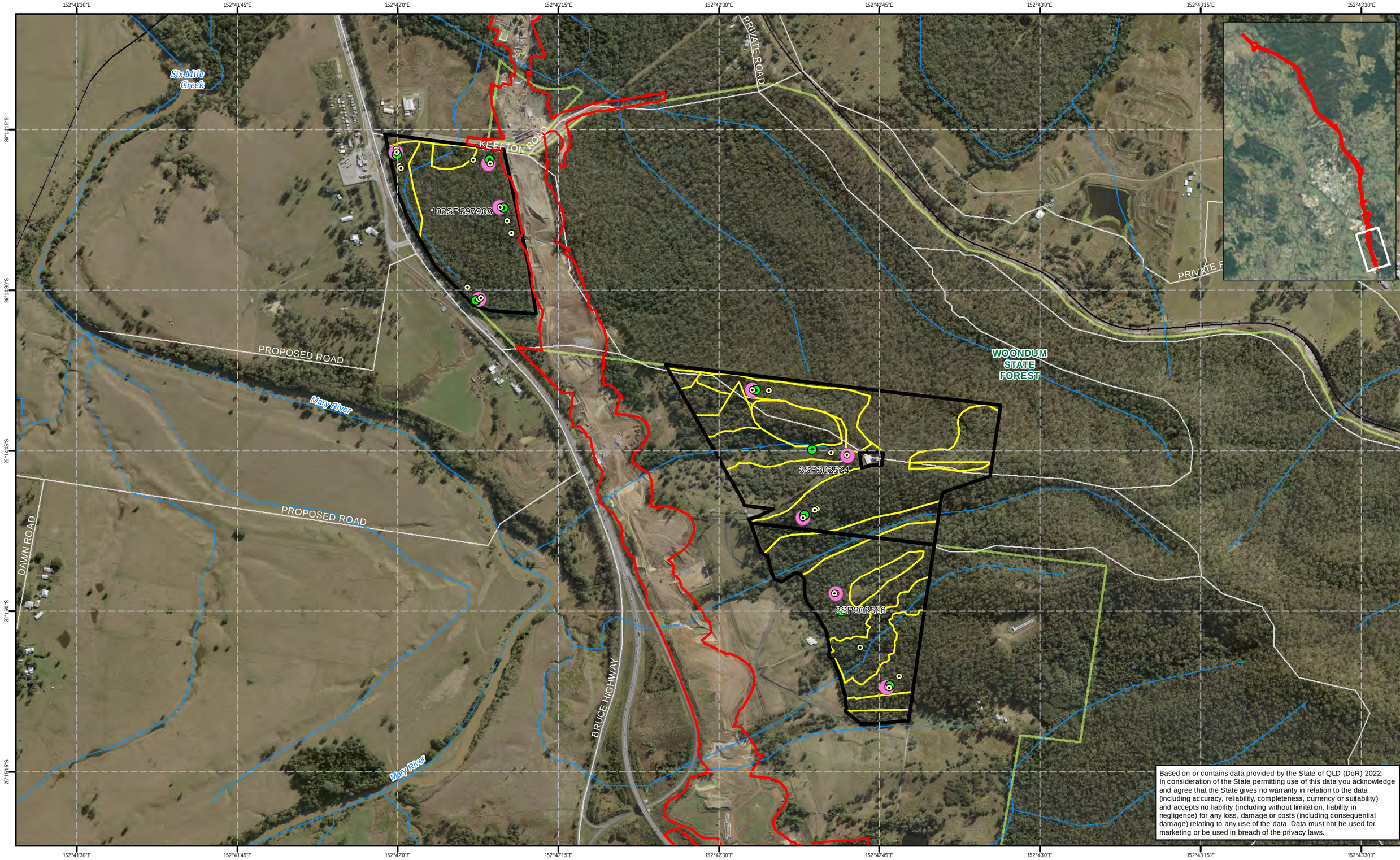

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Koala survey sites Southern Group

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Figure 3-1
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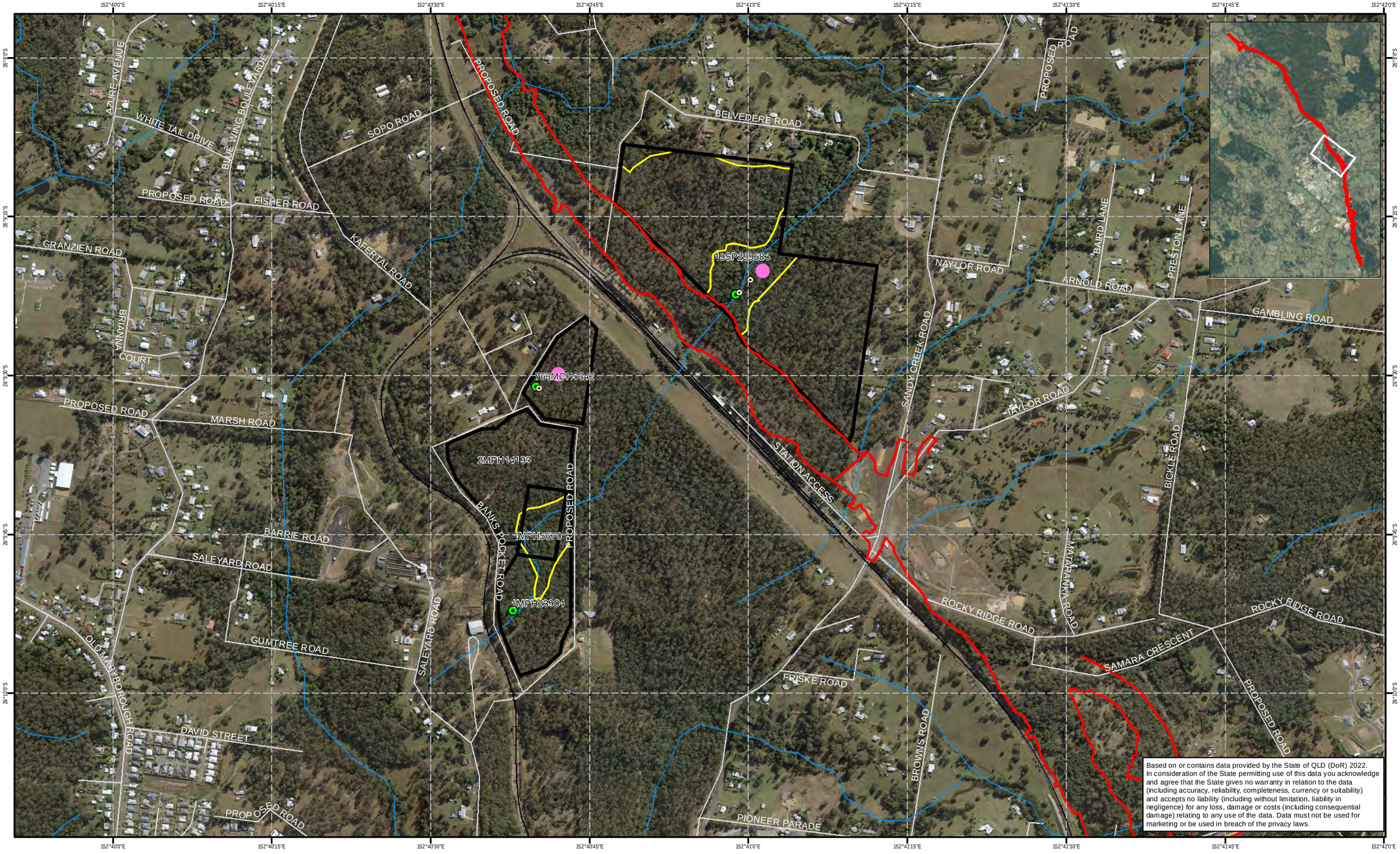

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Grid: GCS GDA 1994

N

LEGEND

- Bio-condition Survey Point
- Transect Waypoint
- Koala Survey Site
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Lots
- Koala Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Koala survey sites Central Group

Job Number	12534030
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Figure 3-1
Page 3 of 3

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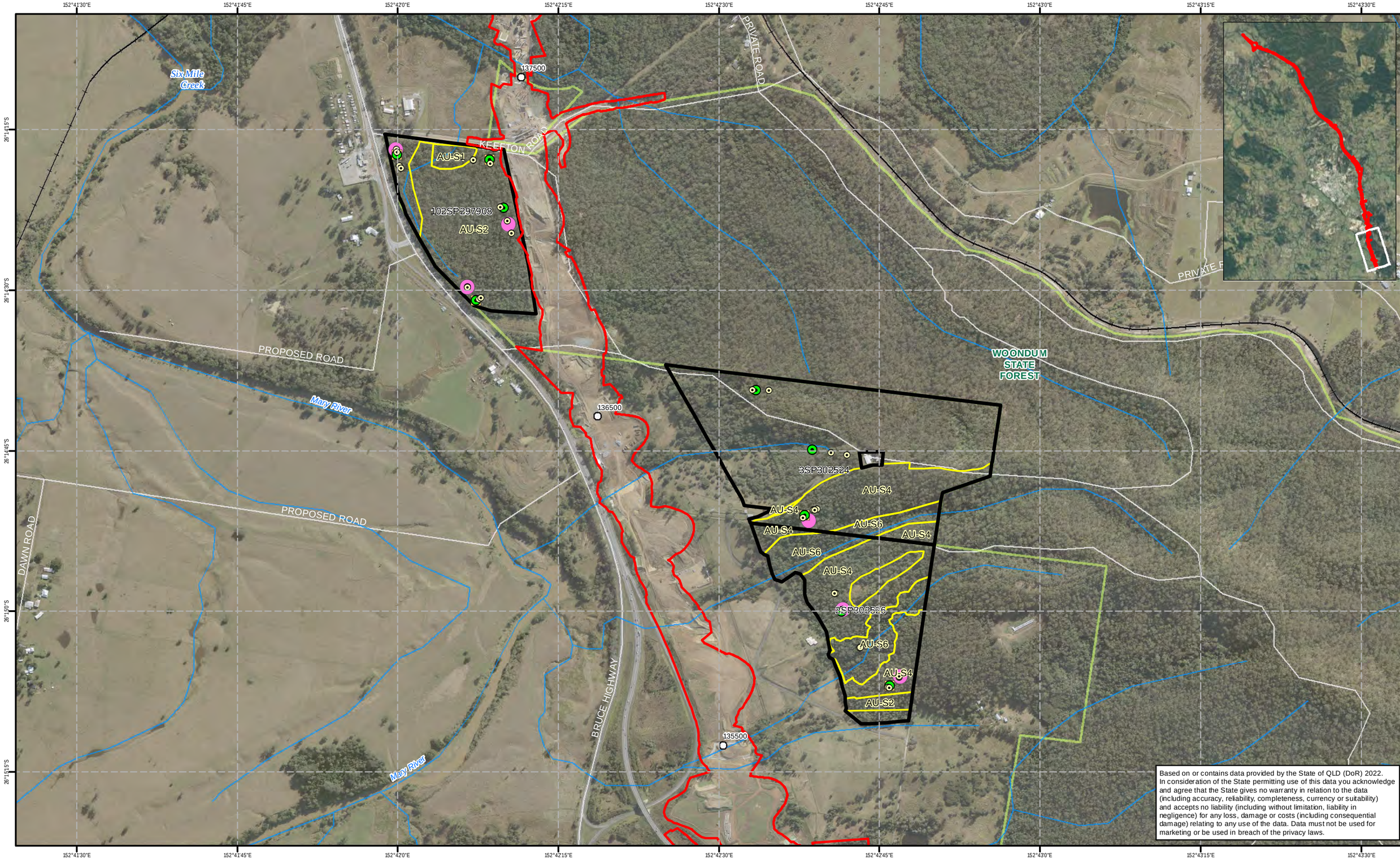

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LEGEND

- Bio-condition Survey Point
- Transect Waypoint
- Remote Camera
- BBBQ Survey Site
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- BBBQ Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Black-breasted button quail sites Southern Group

Job Number	12534030
Revision	A
Date	02 Jun 2022

Figure 3-2

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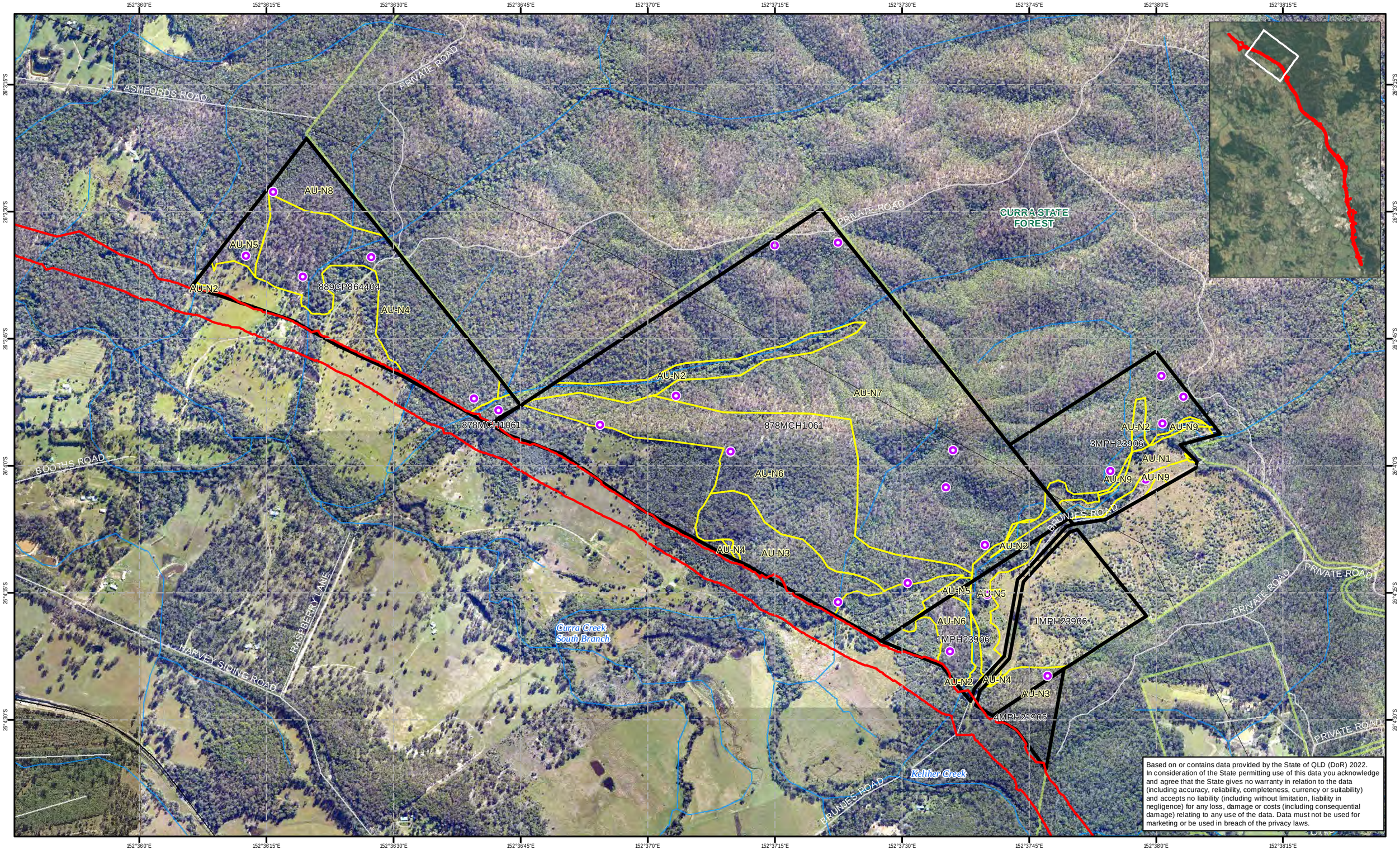

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LEGEND

- Weed survey plots 2020
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Job Number 12534030
Revision A
Date 07 Jun 2022

Weed control monitoring sites Northern Group

Figure 3-3
Page 1 of 3

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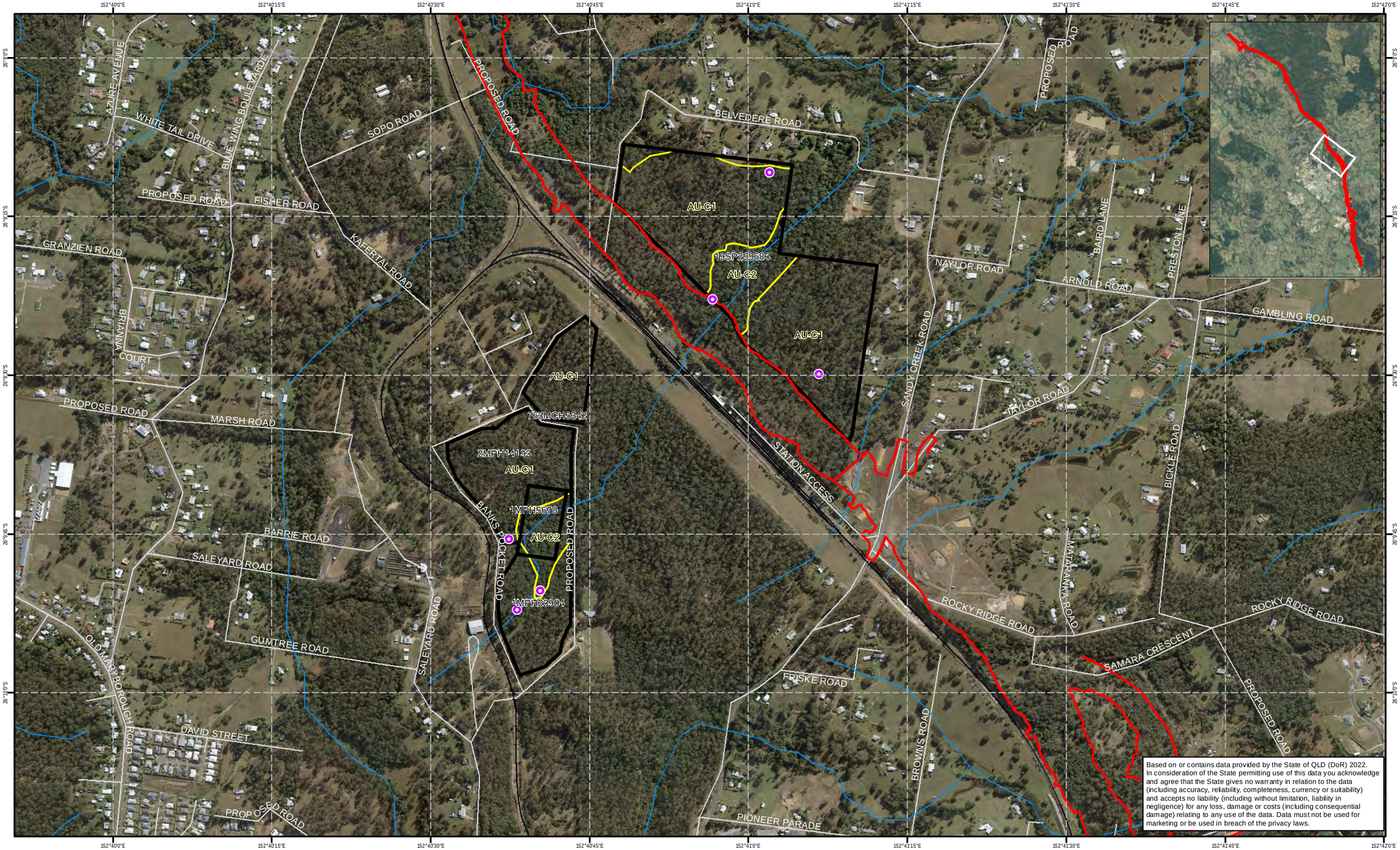

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LEGEND

- Weed survey plots 2020
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Assessment Units

Department of Transport and Main Roads
Bruce Highway Cooroy to Curra
(Section D: Woondum to Curra)

Weed control monitoring sites Central Group

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Figure 3-3
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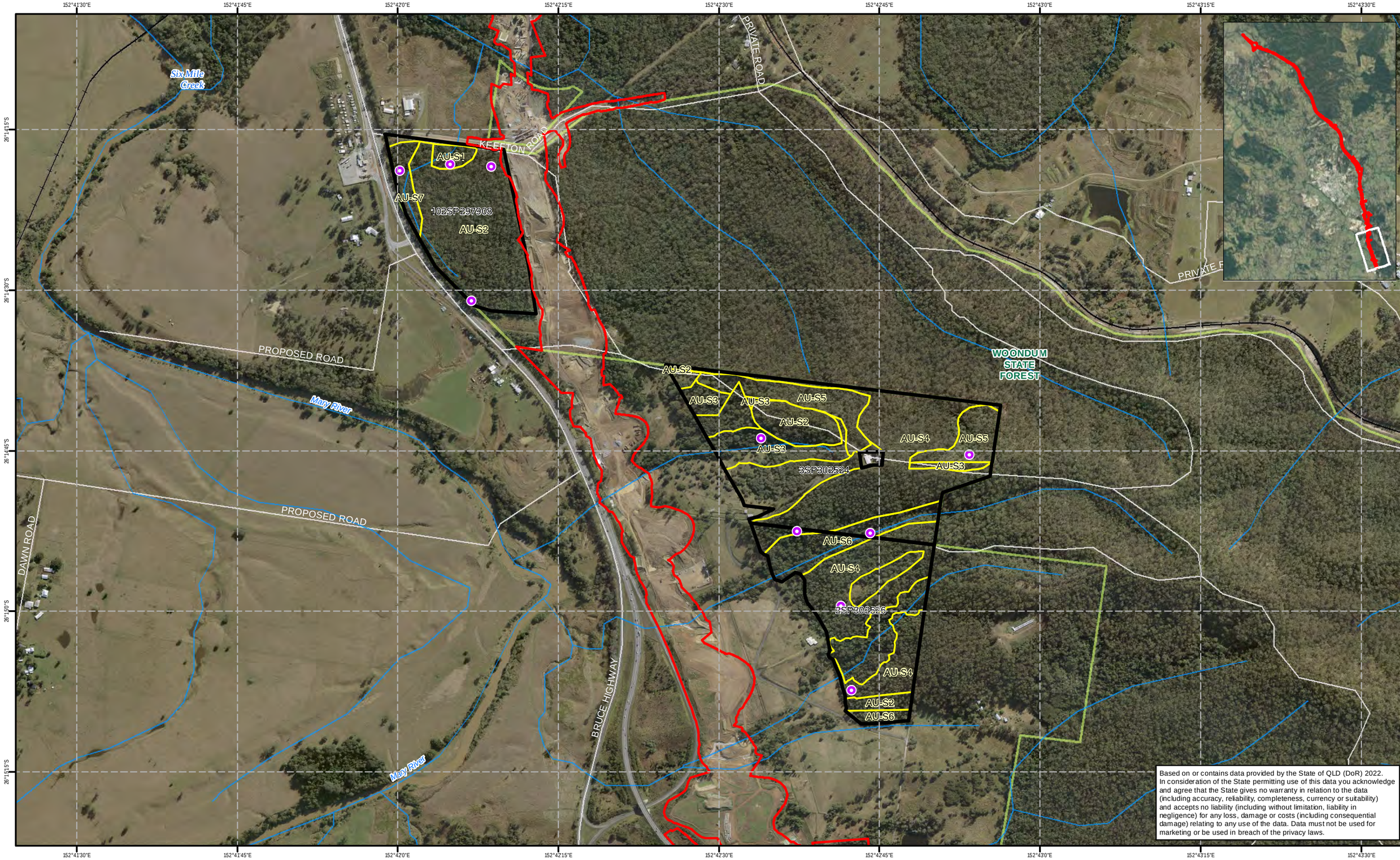

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Weed control monitoring sites Southern Group

Figure 3-3
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3.2 Weather conditions

A significant rain event was experienced in the months immediately proceeding the 2022 monitoring with 344.2 mm of rainfall recorded at the Gympie BOM station on 26 and 27 February 2022. This rainfall event is substantially greater than Gympie's average rainfall for the month of February being 169.6 mm. The rain event caused flooding and overland flows, including localised flash-flooding at individual assessments sites, notably those in the low-lying central assessment units. Low rainfall was recorded in the month prior to survey with 88.4 mm of rainfall recorded, less than the monthly average rainfall for March.

The significant overland flows experienced during February had the potential to influence habitat values particularly for the black-breasted button-quail, by removing leaf litter. Furthermore, this event also potentially reduced the detectability of fauna by washing away existing koala faecal pellets and scats and platelets of the black-breasted button-quail. At the same time, the removal of leaf litter from some sites increased the detectability of fresh koala faecal pellets. Given the potential influence of the flooding event on offset outcomes, the survey timing was considered appropriate.

3.3 Guidelines referenced

A number of Commonwealth and state guidelines were used to develop the monitoring methods that are described within Sections 3.4 and 3.5. The habitat quality scoring assessments (site condition and site context) were completed in general accordance with the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020) to demonstrate compliance with the OMP and EPBC Act approval requirements. The *How to use the Offset Assessment Guide* and the DoCCEEW Modified QLD Habitat Quality template spreadsheet was referred to for assessing species stocking rates.

BioCondition site assessments and regional ecosystem verification has been undertaken in accordance with the *BioCondition Assessment Manual* (Eyre *et al.,* 2015) and Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner *et al.,* 2020). The method proposed for the baseline and biennial weed infestations surveys has been designed to be repeatable and consistent with the principles outlined in the *Field Manual for Surveying and Mapping Nationally Significant Weeds* (McNaught *et al.,* 2008).

Methods employed for the presence of koala include the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE, 2014) which provide guidance on undertaking targeted surveys for the koala, the *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland* (Eyre *et al.,* 2018), and the *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act* (DSEWPaC, 2011). Koala utilisation from faecal pellet searches used the Spot Assessment Technique (SAT) (Phillips and Callaghan, 2011).

It is noted that the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE, 2014) were repealed as a policy document on the 12 February 2022 however, the survey techniques within the guidelines are still considered appropriate.

Methods employed for the presence of black-breasted button-quail have been developed in accordance with the *Survey guidelines for Australia's threatened birds: Guidelines for detecting birds listed as threatened under the EPBC Act* (DEWHA, 2017).

3.4 BioCondition / Habitat quality

In accordance with the EPBC Act approval condition requirements, the quality of habitat for the koala and black-breasted button-quail was assessed, based on the following criteria outlined in the EPBC Act Offsets Assessment Guide:

– Site condition
– Site context
– Species stocking rate.

The offset area groups (Table 2.1) were delineated into a total of 18 AUs comprising similar vegetation (i.e. unique regional ecosystems) and condition states ('remnant' versus 'regrowth') to allow variation in habitat quality within and across groups to be adequately assessed. The establishment of AUs also assisted in determining the location and number of BioCondition plots required (refer to diagram in Figure 3.4). At least one BioCondition plot was established within each of the 18 AUs, with up to three plots established in the larger AUs. Fauna species habitat index assessments were also undertaken at the BioCondition sites.

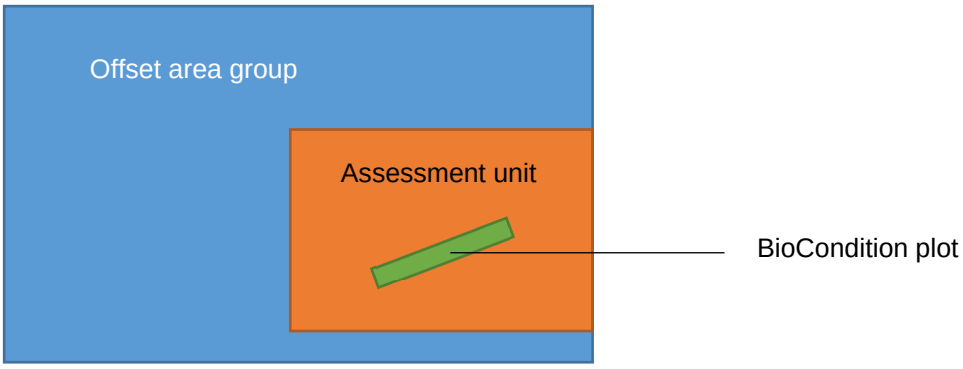


Figure 3.4 Relationship between offset area group, assessment unit and BioCondition plot

A uniform naming system has been applied throughout this report, whereby the AU prefix is followed by the offset group (i.e. N for north, C for central or S for south) then by the plot number if identifying specific plots. For example: AU N7-3 refers to Plot 3 within assessment unit 7 of the northern offset group. The site number is not provided if referring to the average scores across plots within the same AU (e.g. AU N7).

All AUs coincided with habitat for koala and, of those, four also coincided with habitat for black-breasted button-quail. Habitat designations were based on the following:

– **Koala habitat** was defined based on the coastal definition detailed in the *Referral Guidelines for the Vulnerable Koala* (DoE, 2014). Habitat includes forest and woodland dominated by Eucalypt species, Melaleuca and Casuarina woodlands with emergent food trees. Areas included remnant and regrowth vegetation (which may consist of remnant, mature regrowth or areas of less structure that contain some non-juvenile and juvenile koala habitat trees) and disturbed non-remnant areas that contain scattered and isolated koala food trees.
– **Black-breasted button-quail habitat** was defined based on the definition detailed in the Commonwealth listing advice (TSSC, 2015). Habitat included any areas of dry low-closed forest, particularly semi-evergreen vine thicket, low microphyll vine forest, araucarian microphyll vine forest and araucarian notophyll vine forest with dense shrub cover and an abundance of leaf litter and woody debris (Bennett, 1985; Hughes and Hughes, 1991; Marchant and Higgins, 1993).

3.4.1 Site condition

Site condition was calculated for each AU using the following criteria detailed in the DoCCEEW Modified QLD Habitat Quality template:

– BioCondition data consistent with the Guide to determining terrestrial habitat quality (DES, 2020) and the BioCondition Assessment Manual (Eyre et al., 2015)
– Quality and availability of food and foraging habitat
– Quality and availability of shelter.

3.4.1.1 BioCondition plots

BioCondition plots established in 2020 during the baseline surveys and were revisited during the 2022 monitoring event.

Each plot measures 100 m by 50 m. Plots were easily relocated as steel picquets/stakes were installed at the 0 m, 50 m and 100 m mark of each plot transect in 2020. Representative photographs of each plot were taken at the centre of the plot in each aspect (i.e. north, east, south and west).

Each plot was divided into sub-plots, as illustrated by the plot layout diagram provided as Figure 3.5, and the following attributes recorded:

- 100 m transect
  - Tree canopy cover
  - Shrub canopy cover
- 100 m by 50 m plot
  - Total number of large eucalypt and non-eucalypt trees
  - Height of ecologically dominant layer and other canopy/sub-canopy/emergent layers
  - Tree species richness
  - Proportion of the dominant canopy species with evidence of recruitment
- 50 m by 20 m plot
  - Coarse woody debris
- 50 m by 10 m plot
  - Species richness of shrubs, grass, forbs and other native species
  - Weed cover
- Five 1 m by 1 m quadrats
  - Percent cover of native perennial grass
  - Percent cover of organic litter

Attributes were awarded scores based on comparative regional ecosystem (RE) benchmark data in accordance with the methodology prescribed in *BioCondition Assessment Manual* (Eyre *et al.* 2015).

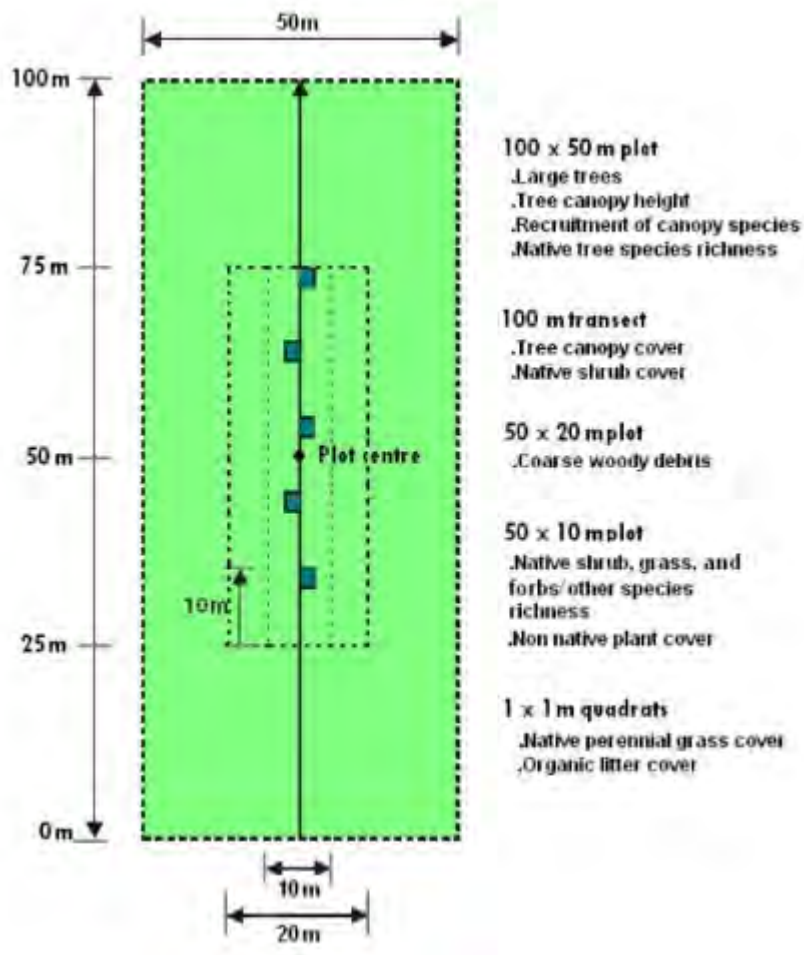


Figure 3.5 Layout of the condition plot

Source: Eyre et al. (2015) BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Version 2.2. Queensland Herbarium

3.4.1.2 Quality and availability of food and foraging habitat

The quality and availability of food and foraging habitat was determined for the koala and black-breasted button-quail using criteria detailed below. Food/food availability scores were calculated for each assessment unit based on the average of all plot scores.

Koala

The quality of food and foraging habitat for the koala was assigned a score out of 10, based on the average score from the following criteria:

– Relative abundance of food trees present – calculated by dividing the number of mature Eucalypt trees in the BioCondition plot by the number of mature Eucalypt trees detailed in the benchmark for that RE community (Queensland Herbarium, 2019), converted to a score out of 10.
– Relative diversity of food tree species present – calculated by dividing the number of koala food tree species in the BioCondition plot by the number of koala food tree species recorded in the technical description for the RE community (Ryan, 2012), converted to a score out of 10.
– Ease of movement – estimated based on the connectivity of vegetation and the physical and behavioural barriers to movement, assigning scores from 0 – 10 where 0 – 2 = (movement totally restricted), 2 - 4 (substantial, frequent barrier), 4 - 6 (moderate, occasional barrier), 6 - 8 (negligible barrier), 8 - 10 (along a koala movement corridor).

Black-breasted button-quail

The quality of food and foraging habitat for the black-breasted button-quail was assigned a score out of 10, based on the average score from the following criteria:

– Leaf litter cover – calculated as the proportion of the BioCondition plot with leaf-litter cover to provide foraging habitat for the black-breasted button-quail, converted to a score out of 10.
– Leaf litter depth – average leaf-litter depth recorded from five randomly selected locations in areas where leaf litter was present. The scores were converted to a score out of 10, by comparing against a maximum leaf-litter depth of 5 cm.

3.4.1.3 Quality and availability of shelter

The quality and availability of shelter was determined for the koala and black-breasted button-quail using criteria detailed below. Shelter quality/availability scores were calculated for each assessment unit based on the average of all plot scores.

Koala

The quality and availability of shelter for the koala was assigned a score out of 10, based on an average of the following scores:

– Canopy cover – obtained from the tree canopy cover measured as a score out of 100 using the BioCondition plot methods detailed above
– Sub-canopy cover – obtained from the sub-canopy cover measured as a score out of 100 using the BioCondition plot methods detailed above
– Shrub cover – obtained from the shrub cover, measured as a score out of 100, using the BioCondition plot methods detailed above.

The total score was calculated as the total proportion converted to a score out of 10, comparing against a total score of 200 (instead of 300) given the low values in even mature woodland areas that had relatively high shelter availability.

Black-breasted button-quail

The quality and availability of shelter for the black-breasted button-quail was assigned a score out of 10, based on the average score from the following criteria:

– Canopy cover obtained from the tree canopy cover measured using the BioCondition plot methods detailed above and converted to a score out of 10.
– Sub-canopy cover obtained from the sub-canopy cover measured using the BioCondition plot methods detailed above and converted to a score out of 10.
– Shelter cover – an estimate of the proportion of the BioCondition plot with sufficient shelter cover (i.e. more than 30 percent cover) for the black-breasted button-quail, converted to a score out of 10.

3.4.2 Site context

For each AU, site context scores were assigned for following characteristics:

– Size of patch
– Connectedness
– Context
– Role of the site location to the overall population in the state
– Threats to the species
– Species mobility capacity.

The first three attributes of size of patch, connectedness, and context were calculated as part of the desktop analysis using Geographic Information System (GIS) modelling consistent with the *Guide to Determining Terrestrial Habitat Quality* (DES 2020) and *BioCondition Assessment Manual* (Eyre *et al.,* 2015). This analysis

included both mapped remnant and regrowth vegetation, using field-verified REs mapped within the offset areas that was supplemented by the version 11 vegetation management REs mapping. Prior to undertaking the GIS analysis, the area of the approved road corridor for the Bruce Highway Project: Cooroy to Curra Section D (Woondum to Curra) was removed from the surrounding RE mapping due to the adjoining and nearby proximity to the offset areas and the resulting potential to reduce future attribute scores after the approved areas are cleared. The GIS analysis did not remove areas mapped as regrowth along watercourses even though they were 100 m wide due to the connectivity that such riparian corridors may provide for fauna species such as koala and black-breasted button-quail.

The site context scoring criteria are provided in Table 3.2.

The *Guide to Determining Terrestrial Habitat Quality* (DES 2020) has removed the requirement to assign a score based on the proximity of the AU to State-mapped ecological corridors, therefore this scoring has not been included in the offset area assessment method.

Table 3.2 Site context scoring criteria

Site context attribute	Criteria	Score
Size of patch	<5 ha remnant and/or regrowth	0
	≥5-25 ha remnant and/or regrowth	2
	≥25-100 ha remnant OR ≥25-200 ha remnant and regrowth OR ≥25-200 ha regrowth	5
	≥100-200 ha remnant OR >200 ha remnant and regrowth OR >200 ha regrowth	7
	≥200 ha remnant	10
Connectivity in the landscape (connectedness)	Low – AU is not connected using any of the below descriptions	0
	Medium – AU is connected with adjacent remnant vegetation along >10% to <50% of its perimeter OR remnant vegetation along <10% of its perimeter and with regrowth native vegetation >25% of its perimeter	2
	High – AU is connected with adjacent remnant vegetation along 50% to 75% of its perimeter	4
	Very High – AU is connected with adjacent remnant vegetation along >75% of its perimeter OR includes >500 ha remnant vegetation	5
Landscape context	Low - <10% remnant vegetation and <30% native non-remnant vegetation (regrowth)	0
	Medium - ≥10% to 30% remnant vegetation and <30% regrowth OR <10% remnant vegetation and ≥30% regrowth	2
	High - ≥30% to 75% remnant vegetation OR ≥10% to 30% remnant vegetation and ≥30% regrowth	4
	Very High - >75% remnant vegetation	5

Methods used to calculate the remaining criteria are detailed below.

3.4.2.1 Role of the site location to the overall population in the state

This value was assigned a score out of 10 for each AU adjusted from a total score out of 60 using the following criteria:

– Scoring framework used to calculate the role of the site used in the species stocking rate calculation scored for each site:
  - Key source population for breeding: No (0), Yes (10)
  - Key source population for dispersal: No (0), Yes (5)
  - Necessary for maintaining genetic diversity: No (0), Yes (15)

- Near the limit of the species range: No (0), Yes (15)

– The usage of the site scored using the following criteria: Not present (0), Dispersal (5), Foraging (10), Breeding (15).

3.4.2.2 Threats to the species

At each AU, threats to the koala and black-breasted button-quail were assessed based on average of all plot scores using criteria detailed below. For both species, the absence of threats were calculated as a score out of 25 using the risk matrix provided in Table 3.3, from the *Guide to Determining Terrestrial Habitat Quality* (DES, 2020). The score was then adjusted to a score out of 10.

Note that threats did not include the results of pest abundance surveys being undertaken across the offset areas, which are separate to these habitat quality assessments.

Table 3.3 Matrix used to score absence of threats

Threat matrix			Severity				
			Very High	High	Medium	Low	Very Low
			1	2	3	4	5
Scope	Very High	1	1	2	3	4	5
	High	2	2	4	6	8	10
	Medium	3	3	6	9	12	15
	Low	4	4	8	12	16	20
	Very Low	5	5	10	15	20	25

Koala

Threats to the koala were calculated as an average of the threats posed by vehicles, wild and domestic dogs, and fire. These were scored out of 25 using the threat matrix detailed above. Threats to koalas from vehicles considered factors including the proximity to roads, volume and speed of traffic and the presence of exclusion fencing, signage and other controls to mitigate collision risk. Threats from dog attack considered factors including proximity to housing, tracks, the availability of refuges, and evidence of dogs seen during BioCondition assessments. Threats from fire considered the relative fuel load, level of public access and presence of fire breaks.

Black-breasted button-quail

Threats to the black-breasted button-quail considered the threats posed by cats and fire. Threats from cats considered factors including the proximity to housing, tracks, the abundance of ground-cover and evidence of cats during field surveys. Threats from fire considered the relative fuel load, level of public access and presence of fire breaks.

3.4.2.3 Species mobility capability

The species mobility capability was scored for the koala and black-breasted button-quail using criteria below.

Koala

For each AU site, a species mobility capability score was assigned for the koala. This was a score out of 10, based on an average of the following scores:

– **Habitat connectivity** – score out of 10 from: 0 - 2 (totally isolated), 2 - 4 partially isolated, 4 - 6 (periodically isolated), 6 - 8 major connectivity, 8 - 10 (totally connected).

– **Behavioral deterrents to movement** – scored out of 10 considering the likely energetic cost and threat of exposure to predation by moving to that location from adjacent areas: 0 - 2 (extreme risk), 2 - 4 (high risk), 4 - 6 (moderate risk), 6 - 8 (low risk), 8 - 10 (zero risk).

– **Physical deterrents to movement** – scored out of 10 based on physical barriers: 0 - 2 (total barrier), 2 - 4 (substantial, frequent barrier), 4 - 6 (moderate, occasional barrier), 6 - 8 (negligible barrier), 8 - 10 (active movement pathway – i.e. watercourse or linear corridor).

Black-breasted button-quail

For each AU site, a species mobility capability score was assigned for the black-breasted button-quail. This was a score out of 10, based on an average of the following scores:

– **Habitat connectivity** – score out of 10 from: 0 - 2 (totally isolated), 2 - 4 partially isolated, 4 - 6 (periodically isolated), 6 - 8 major connectivity, 8 - 10 (totally connected).
– **Physical deterrents to movement** – scored out of 10: 0 - 2 (total barrier), 2 - 4 (substantial, frequent barrier), 4 - 6 (moderate, occasional barrier), 6 - 8 (negligible barrier), 8 - 10 (active movement pathway – i.e. watercourse or linear corridor).

3.4.2.4 Species stocking rate

For the offset areas as a whole, a single value of species stocking rate was calculated using the criteria detailed in Table 3.4, based on the scoring system in the DoCCEEW Modified QLD Habitat Quality template.

Table 3.4 Criteria used to score species stocking rate

Criteria	Score			
Presence detected on or adjacent to the site	0	5		10
	No	Yes - adjacent		Yes – on site
Species usage of the site	0	5	10	15
	Not habitat	Dispersal	Foraging	Breeding
Approximate density	0	10	20	30
Koala	0	0.001 – 0.6	0.6 - 5	>5
Black-breasted button-quail	0	1 - 3	4 - 6	>6
Role/importance of species population on site	0	5	10	15
	0	5 - 15	20 - 35	40 - 45

Presence detected on or adjacent

Presence detected was based on past and present survey evidence, including remote surveillance cameras, aerial drone survey, faecal pellet searches, and other indirect trace searches. Presence surveys for koala and black-breasted button-quail are described in Sections 3.4.3 and 3.4.4, respectively.

Species usage

The usage of the offset area was assessed for both species, assigning it to one of the four following categories: not habitat (0), dispersal (5), foraging (10) or breeding (15) habitat. This was based on the general size and quality of habitats present and connectivity to other habitats in the surrounding landscape. Given the scale of the offset areas, the presence of individuals was considered evidence of breeding, particularly for the black-breasted button-quail, as the local population would be functionally isolated from other populations that could otherwise be a breeding source.

Approximate density

For koalas, the relative density was based on a multiplication of koala densities recorded by drone koala surveys and local koala utilisation from faecal pellet searches using the SAT (Phillips and Callaghan, 2011), as outlined in Table 3.5. The scoring framework for both koala density and utilisation was broadly consistent with that used in Phillips and Callaghan (2011). Drone koala density values were scored for the northern, central and southern offset areas and local koala utilisation values were scored for each AU based on the results of SAT searches undertaken at the same time as BioCondition surveys.

Table 3.5 Criteria used to score koala density

Density category	Drone density	SAT score	Multiplied density score
High (30)	>0.5 koala /ha	>10 (33%)	>5
Moderate (20)	0.1 – 0.5 koala/ha	6 – 10 (20 – 33%)	0.6 – 5
Low (10)	0.001 – 0.1 koala/ha	1 – 6 (3.33 – 20%)	0.001 – 0.6
Absent (0)	0	0	0

For the black-breasted button-quail, the relative density was based on an arbitrary index of activity, using the average number of platelets observed per 10 m x 10 m plot within areas where the species was detected using the following scoring framework: 0 = no platelets (absent), 10 = 1 – 3 platelets (low density), 20 = 4 – 6 platelets (medium density), 30 = > 6 platelets (high density).

Role / importance of the species population

For the offset areas as a whole, the role / importance of the species population on site was assessed using the criteria detailed in Table 3.6 based on the supplementary table to the Species Stocking Rate in the DoCCEEW Modified QLD Habitat Quality template, out of a score of 45, which was then converted to a score out of 15. The scoring of these criteria were derived from available information about each species in general and in the region, considering the geographic location and connectivity of the local population in the context of the species' broader range. Large areas of contiguous habitat with confirmed records were considered source populations for breeding. Areas of high value habitat with high connectivity to external areas were considered source populations for dispersal. Populations that represent one of only few representatives of the species in a geographic area were considered important for maintaining genetic diversity. The distribution of the species, as mapped in the Commonwealth Species Profile and Threat Database for each species was used to determine whether the population was near the limits of the species' known range.

Table 3.6 Criteria used to score role/importance of the population

Criteria	Score	
Key source population for breeding	0	10
	No	Yes/Possibly
Key source population for dispersal	0	5
	No	Yes/Possibly
Necessary for maintaining genetic diversity	0	15
	No	Yes/Possibly
Near the limit of the species range	0	15
	No	Yes

3.4.3 Koala presence

To comply with the EPBC Act approval conditions, targeted surveys were undertaken over three survey events to confirm the presence of the koala, using methods consistent with the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE, 2014), the *Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland* (Eyre *et al.,* 2018), and the *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act* (DSEWPaC, 2011). Surveys involved aerial drone surveys, faecal pellet searches, deployment of remote surveillance cameras, and targeted habitat assessments. Targeted survey methods used to detect the koala were employed at the koala offset areas outlined in Table 2.1 and shown in Figure 2.1. Survey site locations are shown in Figure 3.1.

It is noted that the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE, 2014) were repealed as a policy document on the 12 February 2022 however, the survey techniques within the guidelines are still considered appropriate.

3.4.3.1 Drone koala density surveys

Thermal drone operators and koala researchers from the University of Sunshine Coast (USC) undertook targeted drone surveys for koalas within the offset areas over 20 days between May 2022 and June 2022. The area surveyed by drone in the current survey was smaller than that assessed in the baseline survey, with flights restricted to areas within and immediately adjacent to (i.e. within 200 m) of the offset area. For consistency, only koalas recorded in and adjacent to the offset area in the baseline survey were compared. The results of those surveys were used to calculate koala densities for the northern, central and southern offset areas. Methods are described in Appendix A and summarised in Table 3.7.

3.4.3.2 Localised koala utilisation (SAT) surveys

A key measure of the improvement in koala habitat value that is being sought over the life of the offset is an increase in the utilisation of habitat by koalas. This is a critical measure as it demonstrates that the koalas that occur locally are able to increase the area of land that is actively utilised as habitat for forage and shelter. This is achieved through the growth of new koala food trees and the reduction in invasive weeds such as Lantana that exclude koalas from areas of habitat. The local utilisation of habitat by koalas was assessed based on the results of targeted faecal pellet searches using SAT surveys (Phillips and Callaghan, 2011). The quality of habitat was assessed based on targeted habitat assessments. Methods used are described in Table 3.7.

Table 3.7 Survey methods used to detect koalas

Survey method	Details
Faecal pellet searches	Targeted faecal pellet searches were undertaken at each assessment unit site by GHD ecologists in March 2022 using the SAT search method - searching within 1 m of the base of 30 mature koala food trees for a maximum of 2 minutes per tree. Relative utilisation levels were scored based on the scoring framework detailed in Phillips and Callaghan (2011) for east coast medium - high density populations where: - Absent = koala scats absent - Low use = 1 – 22.52% trees with koala scats - Medium use = 22.52 – 32.84% trees with koala scats - High use = > 32.84% trees with koala scats.
Koala habitat assessments	Koala habitat assessments were undertaken by GHD ecologists in March 2022, recording the quality and availability of food and foraging habitat, the quality and availability of shelter and the absence of threats from vehicles, dogs and fire at each plot. Factors recorded including the number of large food trees (i.e. the number in the 100 m x 50 m plot that exceeded the large native tree size in the benchmark for that RE community (Queensland Herbarium, 2019)), the number of food tree species, canopy cover, sub-canopy cover, shrub cover, the relative abundance of woody weeds, presence of dog footprints or scats, proximity to tracks and housing, proximity to roads, road traffic volume and speed, presence of exclusion fencing, signage, lighting, speed mitigation measures, relative fuel load, level of public access and utilisation and presence of fire breaks. Scoring breakdowns for each are detailed in Section 3.4.
Aerial drone thermal imaging surveys	USC undertook aerial drone surveys across each of the offset areas. Drone flights were flown late at night or early morning to maximise temperature differential between koalas and the environment. Methods are described in Appendix A.

3.4.4 Black-breasted button-quail presence

To comply with the EPBC Act approval conditions, targeted surveys were undertaken over three survey events to confirm the presence of the black-breasted button-quail, using methods consistent with those detailed for the species in the *Survey Guidelines for Australia's Threatened Birds* (DEWHA, 2017). Surveys involved land-based area searches for birds, platelets and scats, deployment of remote surveillance cameras and targeted habitat assessments. Targeted survey methods used to detect the black-breasted button-quail, detailed in Table 3.8 were employed at each of the black-breasted button-quail offset sites outlined in Table 2.1 and shown in Figure 2.2. Survey site locations are shown in Figure 3.2.

Table 3.8 Black-breasted button-quail survey methods

Survey method	Details
Active diurnal searches	Targeted searches were undertaken for bird and signs (i.e. feeding platelets and scats) within each of the BioCondition plots and surrounding areas to a distance of 200 m. Where platelets were detected, the number of platelets within a 50 m x 50 m plot was recorded. Any scats observed were photographed for identification. Targeted surveys of the potential habitat within the offset areas (32.68 ha) for the black-breasted button-quail included 16 person hours over four days as detailed in Table 3.1, exceeding the 15 hours recommended for areas less than 50 ha in *The Survey Guidelines for Australia's Threatened Birds* (DEWHA 2017).
Remote surveillance cameras	Where platelets were found, remote surveillance cameras were set and trained on areas of suitable foraging habitat. Each camera was attached to a tree at a height of approximately 20 – 30 cm, angled toward the ground at a 45-degree angle. A total of 4 cameras were set at locations mapped in Figure 3.2. Cameras were set on 28 March and left in situ for 4 days, collected on 1 April 2022.
Incidental records	Record the location and sound of any black-breasted button-quail calls heard.
Targeted habitat assessment	The nature and composition of vegetation was documented at canopy, shrub and ground levels. The following key habitat criteria for the BBBQ was assessed: - Presence and depth of leaf litter - Canopy cover - Density of understorey vegetation - Landscape context. In general, good quality habitats have broad coverage of deep leaf litter, good connectivity and high levels of canopy cover provided by canopy, sub-canopy and understorey vegetation.

3.5 Weed infestation

3.5.1 Desktop survey

Locations of previously established weed monitoring quadrats within AUs were loaded into the ArcCollector application for use in the field.

3.5.2 Field survey

Two ecologists revisited 40 permanent weed monitoring quadrats (10 x 10 m) established in 2020 to monitor the efficacy of weed control operations. Target species present and densities (covers) within each quadrat were recorded. Cover was recorded as percentage crown cover, except for ground layer species whereby cover was recorded as projective foliage cover. Data collected was restricted to those weed species that have potential to adversely impact on habitat quality or movement opportunities for the koala and black-breasted button quail (refer Table 3.9). The locations of weed monitoring survey plots are shown in Figure 3.3. It is noted that quadrat C2- 1 was relocated in 2022 due to its proximity to the adjacent construction site. The alternate location is shown in Figure 3.3 with the new quadrat assigned the code Alt C2-1 for data analysis and reporting purposes.

Table 3.9 Target weed species

Scientific name	Common name
Asparagus aethiopicus	Ground asparagus
Asparagus plumosus	Climbing asparagus
Baccharis halimifolia	Groundsel bush
Celtis sinensis	Chinese elm
Cinnamomum camphora	Camphor laurel
Dolichandra unguis-cati	Cat's claw creeper
Eugenia uniflora	Brazilian cherry tree
Lantana camara	Lantana

Scientific name	Common name
Megathyrsus maximus	Green panic
Ochna serrulata	Ochna
Passiflora suberosa	Corky passion flower
Passiflora subpeltata	White passion flower
Passiflora edulis	Common passionfruit
Senna occidentalis	Coffee senna
Senna pendula	Easter cassia
Sphagneticola trilobata	Singapore daisy
Sporobolus spp.	Giant rat's tail
Solanum torvum	Devil's fig

3.6 Pest abundance

Baseline pest abundance is being undertaken by Ecosure and will be reported separate to this report. Pest abundance is not referenced again within this document.

3.7 General site features

Within each AU and offset area in general, opportunistic observations were made of the following features that have potential implications for management of habitat for the koala and black-breasted button-quail:

- Location of fences or other infrastructure to be removed, replaced or repaired given the influence on movement or exposure to threats from predators and vehicles
- Cleared areas that could be used for replanting, including site characteristics such as soil type, landform, extent and cover of existing koala food tree species (species of the genera *Eucalyptus, Corymbia, Lophostemon, Angophora* and *Melaleuca* that are known to be consumed by the koala and are greater than 4 m height or with a trunk circumference greater than 31.5 cm at 1.3 m above the ground), mapped extent of areas, weed species, other existing disturbances
- Disturbed or regrowth areas that could be used for natural regeneration/recruitment, including type, extent and estimate of cover or abundance of koala food tree species (as per above definition) and heights/size ranges, mapped extent of areas, weed species, other existing disturbances
- Locations of access tracks
- Locations of fire breaks and evidence of past fires
- Presence of waste to be removed
- Evidence of erosion that requires remediation
- Evidence of past and current land use, access and other human activities (e.g. logging, recreational vehicle access, stock grazing)
- Natural disturbances such as tree falls, dieback due to drought, flood or other natural disaster
- Any other threats or degradation of the land and habitat
- Photos of recorded features and at permanent photo monitoring points
- Locations of permanent photo monitoring points.

Features were georeferenced on ArcCollector and included where relevant on management maps.

4. Monitoring results

4.1 Habitat quality

BioCondition plots and fauna species habitat index assessments were undertaken at the BioCondition sites shown in Figure 3.1 for koala and Figure 3.2 for black-breasted button-quail, with results for each species shown in the Modified QLD Habitat Quality spreadsheet in Appendix B. The following sections provide an overview of BioCondition and fauna species habitat survey results, with BioCondition attributes discussed by AU and species habitat attributes presented separately for koala and black-breasted button-quail.

4.1.1 BioCondition data

BioCondition field data collected for each site is provided at Appendix C with scores derived from field data shown in the Modified QLD Habitat Quality spreadsheet at Appendix B. A summary of total average scores and ranges recorded across the offset area for each attribute for the 2022 biennial monitoring event is provided in Table 4.1.

4.1.1.1 AU scores

Total average attribute scores for respective AUs ranged from 24 to 60.5 out of a possible 80, suggesting that all AUs have capacity for improvement (Table 4.1). All but two AUs had total scores of 40 or greater. AUs N-9 and N- recorded the lowest total average scores of 24 and 33.5 respectively; both AUs were field-verified as comprising regrowth vegetation with a largely absent tree layer.

4.1.1.2 Attribute scores

A radar graph showing the total average scores for each attribute across the offset area relative to the maximum permissible score for each attribute (expressed as percentages) is presented in Figure 4.1.

As can be seen from Table 4.1 and Figure 4.1, the attributes with the lowest relative average scores and therefore the greatest capacity for improvement were non-native plant cover (i.e. weeds) and the number of large native trees (i.e. natural regeneration). Whilst the latter may possess capacity for improvement, any increase is likely to be gradual and measurable improvements may not be realised within the timeframe of the monitoring program. Nevertheless, other attributes such as native grass cover and native forb species richness were also low and possess considerable capacity for improvement within the timeframes of the monitoring program.

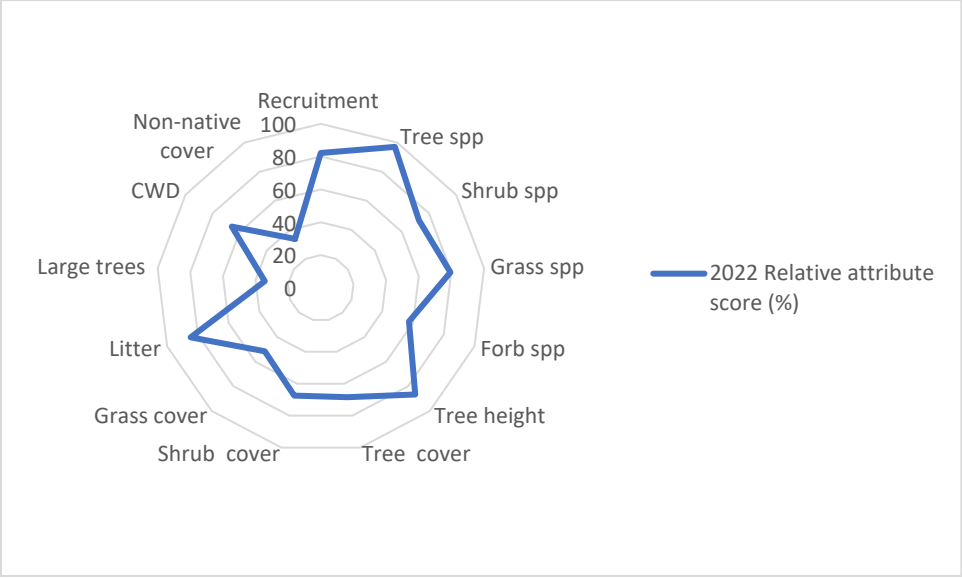


Figure 4.1 Average BioCondition scores across offset areas relative to maximum possible scores (expressed as percentages)

Table 4.1 Average attribute scores for respective AUs

Attributes	Assessment Units (AUs)																		Max possible score	Range	Total average score (relative score*)
	N1	N2	N3	N4	N5	N6	N7	N8	N9	C1	C2	S1	S2	S3	S4	S5	S6	S7			
Recruitment	5	5	4	5	5	4	4.3	5	5	1.5	3	0	3	5	5	5	5	3	5	0-5	4.11 (82.2)
Native tree spp richness	5	5	5	5	5	5	5	5	2.5	5	5	5	5	5	5	5	5	5	5	2.5-5	4.85 (97)
Native shrub spp richness	0	5	5	5	5	5	4.2	2.5	0	2.5	5	5	5	2.5	5	2.5	2.5	5	5	0-5	3.63 (72.6)
Native grass spp richness	2.5	2.5	5	5	5	5	4.2	5	2.5	5	2.5	0	5	5	3.3	5	5	2.5	5	0-5	3.97 (79.4)
Native forb spp richness	2.5	2.5	2.5	3.8	5	2.5	4.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3.3	2.5	2.5	2.5	5	2.5-5	2.87 (57.4)
Tree height	1.5	5	4	5	4	4	5	5	1.5	5	5	5	5	5	4.4	5	4.2	5	5	1.5-5	4.33 (86.6)
Tree cover	1	4	3.8	5	3.5	4.5	3	1.5	0	4.5	4	4	3.3	4	3.8	4	4.2	4	5	0-5	3.42 (68.4)
Shrub cover	0	3	4	3	3	3	5	3	0	4	5	5	4	3	4.3	5	3	5	5	0-5	3.37 (67.4)
Grass cover	1	5	0.5	3	5	0.5	1.7	1	5	4	3	1	5	5	1	1	1	5	5	0.5-5	2.57 (51.4)
Litter	5	3	4	4	5	5	5	5	0	4	5	5	4	5	5	5	3	5	5	0-5	4.24 (84.8)
Large trees	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	7.5	5	15	5-7.5	5.15 (34.3)
Coarse woody debris	0	2	3.5	3.5	5	3.5	5	2	0	5	5	2	3.5	5	4	5	2	5	5	0-5	3.29 (65.8)
Non-native cover	5	0	0	3	5	3	1	5	0	6.5	5	10	5	3	1	0	5	3	10	0-10	3.38 (33.8)
TOTAL SCORE	33.5	47	46.3	55.3	60.5	50	52.6	47.5	24	54.5	55	49.5	55.3	55	50.1	50	49.9	55	80	24 - 60.5	49.18 (61.5%)

*Relative score was derived by dividing the total average score by the maximum possible score and expressing as a percentage.

Whilst total averages for each attribute provide a broad indication of condition and capacity for improvement across the broader offset areas, considerable variation was recorded for most attributes across AUs (refer Figure 4.2 to Figure 4.5). For instance, non-native cover scores across AUs ranged from 0-10, with four AUs recording nil scores and only one AU recording a maximum score of 10 (Figure 4.6). Consequently, weed control is likely to be an effective measure for improving condition in those AUs with higher weed cover densities. The least variability across AUs was recorded in relation to tree species richness, forb species richness and the number of large trees, where scores varied by no more than 2.5 points.

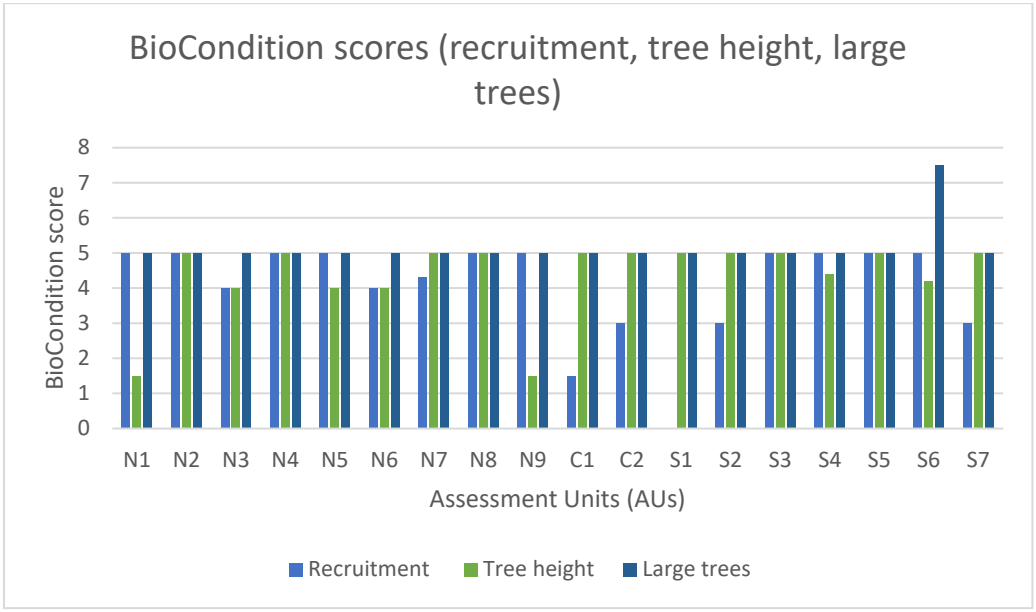


Figure 4.2 Average attribute scores for EDL recruitment, tree canopy height and number of large trees across AUs

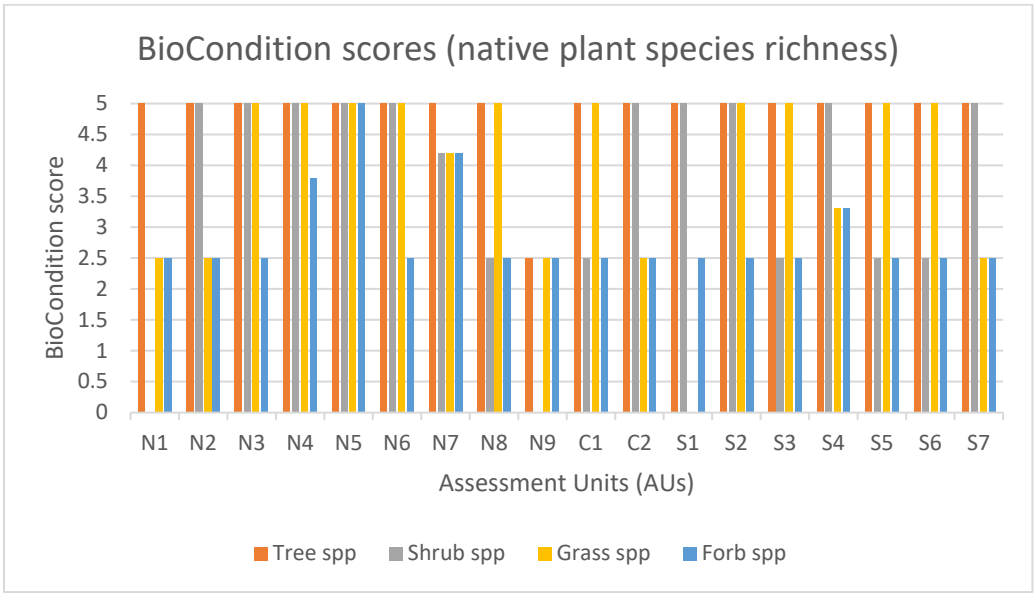


Figure 4.3 Average attribute scores for EDL recruitment, tree canopy height and number of large trees across AUs

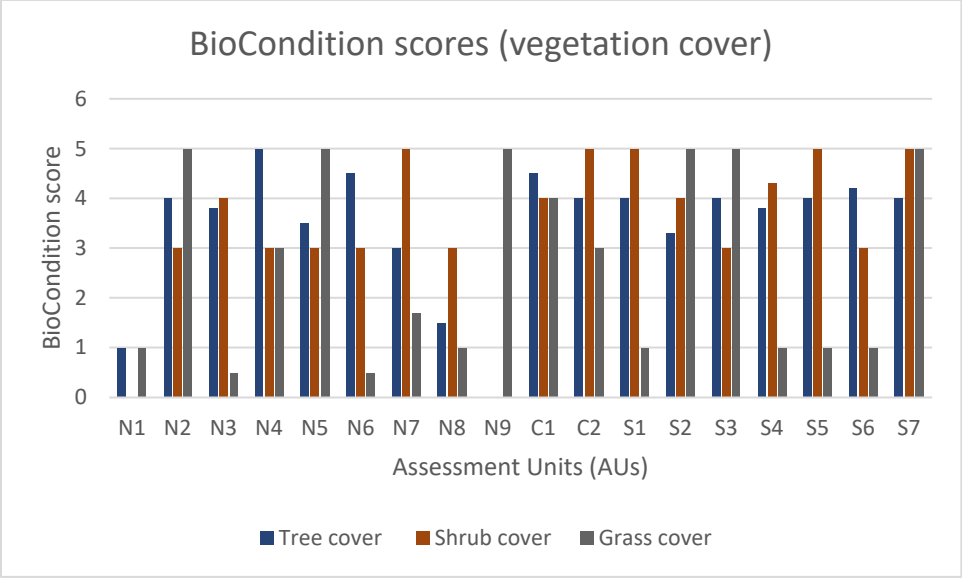


Figure 4.4 ***Average attribute scores for vegetation cover across AUs***

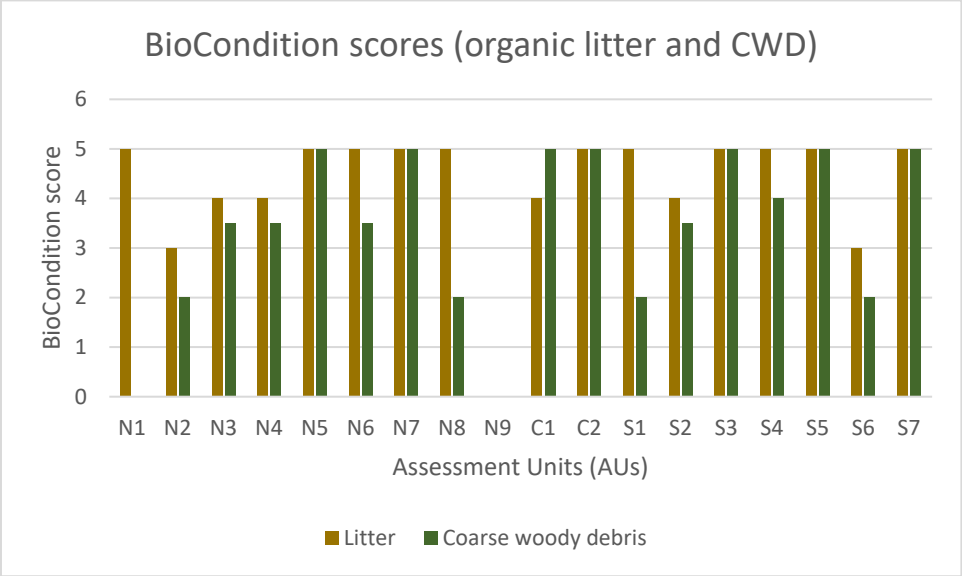


Figure 4.5 ***Average attribute scores for organic litter and coarse woody debris across AUs***

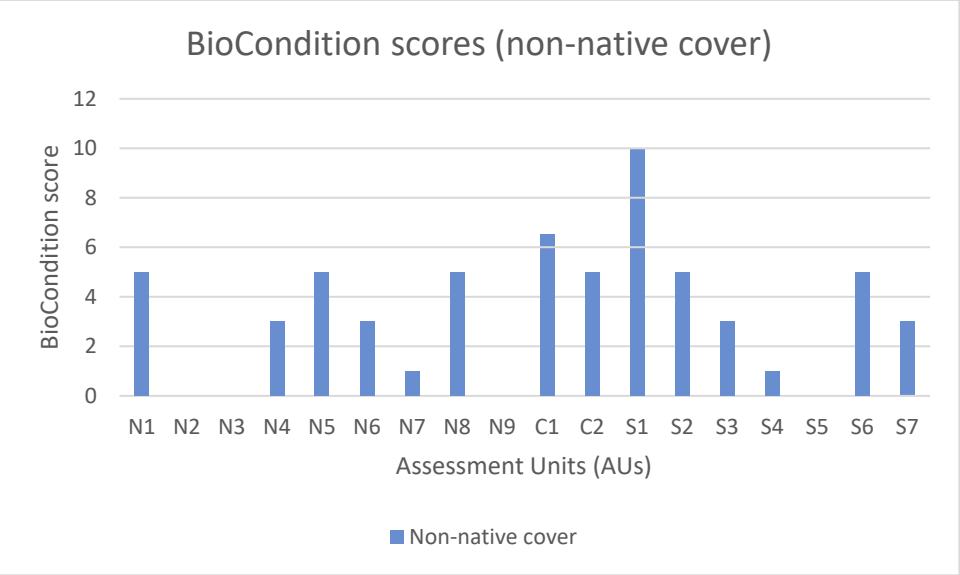


Figure 4.6 Average attribute scores for non-native plant cover across AUs

4.1.1.3 Baseline data comparison

The overall total BioCondition score[2] increased from 43.9 (out of a possible 80) in 2020 to 49.18 in 2022.

This represents an increase of 6.6% percentage points when comparing relative scores[3] over the two monitoring events. Attributes showing the most improvement across AUs included perennial native grass cover and non-native plant cover, with average recorded increases in relative scores of 30.2 and 27.9 percentage points respectively (noting that a higher relative score for non-native plant cover relects a reduction in non-native cover). Average relative scores for each attribute across the offset area for each of the monitoring events is presented in in Table 4.2 and represented spatially in Figure 4.7.

It is noted that the analysis was limited to the interrogation of data from two monitoring events only. As such, any observed change may not be indicative of a trend and should be treated with caution at this early stage in the biennial monitoring program. This latest monitoring event (Year 1 biennial monitoring event) was also conducted following a sustained period of higher than average rainfall and native grass cover and richness may be a response to more favourable conditions rather than ongoing weed management.

Table 4.2 Changes in average relative scores across AUs between 2020 and 2022

Attribute	2020 Total average score (relative score [3])	2022 Total average score (relative score [3])	Change from 2020 to 2022 (percentage points)
Recruitment	79	82.2	3.2
Tree spp	95.2	97	1.8
Shrub spp	82.2	72.6	-9.6
Grass spp	67	79.4	12.4
Forb spp	58.8	57.4	-1.4
Tree height	83.8	86.6	2.8
Tree cover	69.8	68.4	-1.4
Shrub cover	61	67.4	6.4
Grass cover	21.2	51.4	30.2
Litter	100	84.8	-15.2

[2] Overall total BioCondition Score – average of the total BioCondition scores calculated for each AU

[3] Relative score –score out of the maximum permissible score, expressed as a percentage

Attribute	2020 Total average score (relative score [3])	2022 Total average score (relative score [3])	Change from 2020 to 2022 (percentage points)
Large trees	27.5	34.3	6.9
CWD	65.8	65.8	0.0
Non-native cover	5.9	33.8	27.9

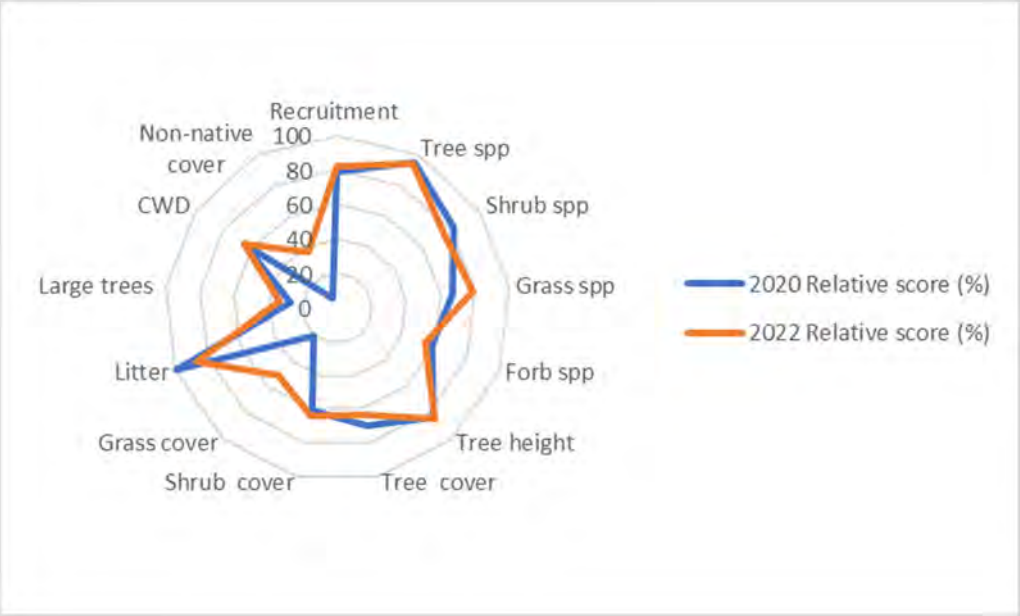


Figure 4.7 Comparison of relative BioCondition scores for respective attributes over time (2020 – 2022)

4.1.2 Site context

The results of the GIS analysis for site context are presented in the following sections, including the scores attributed based on the criteria provided in Section 3.4.2.

4.1.2.1 Size of patch

The patch sizes relate to the network of connected remnant and regrowth mapped areas surrounding each AU. The inclusion of regrowth vegetation mapped along watercourses within the GIS analysis resulted in high patch sizes, with all of the northern and central offset group AUs scoring 10, and only two AUs in the southern group scoring less than 10. The results were the same for both the koala and the black-breasted button-quail AUs, as shown in Table 4.3.

Table 4.3 Size of patch

Assessment unit	Size of patch (ha)	Score
N1	3928.42 remnant	10
N2	3928.42 remnant	10
N3	3928.42 remnant	10
N4	3928.42 remnant	10
N5	3928.42 remnant	10
N6	3928.42 remnant	10
N7	3928.42 remnant	10
N8	3928.42 remnant	10
N9	3928.42 remnant	10

Assessment unit	Size of patch (ha)	Score
C1	4027.32 remnant	10
C2 (Alt)	4027.31 remnant	10
S1*	12.81 remnant	2
S2*	998.85 remnant	10
S3	985.43 remnant	10
S4*	985.43 remnant	10
S5	985.43 remnant	10
S6*	986.04 remnant (985.43 remnant*)	10
S7	12.81 remnant	2

* Only these AUs also relate to black-breasted button-quail offset areas (with adjusted results marked with *)

4.1.2.2 Connectivity in the landscape

The connectedness results relate to the percentage of the boundary of each AU that connects directly to mapped remnant and regrowth vegetation, as an indication of the capacity for species to disperse through the landscape. There was some difference in results between the koala and the black-breasted button-quail AUs due to the black-breasted button-quail offset areas forming only part of the offset areas for koala, as shown in Table 4.4.

Table 4.4 Connectedness results

Assessment unit	Connectedness	Score
N1	24.80 % remnant	2
N2	73.47 % remnant	4
N3	71.51 % remnant	4
N4	45.08 % remnant	2
N5	35.75 % remnant	2
N6	66.00 % remnant	4
N7	91.94 % remnant	5
N8	99.11 % remnant	5
N9	18.29 % remnant	2
C1	87.13 % remnant	5
C2 (Alt)	92.02 % remnant	5
S1*	65.16 % remnant	4
S2*	62.02 % remnant (80.12 % remnant*)	4 (5*)
S3	31.26 % remnant	2
S4*	63.28 % remnant (70.24 % remnant*)	4
S5	54.78 % remnant	4
S6*	83.58 % remnant (92.83 % remnant*)	5
S7	86.28 % remnant	5

* Only these AUs also relate to black-breasted button-quail offset areas (with any differing results marked with *)

4.1.2.3 Landscape context

The landscape context scoring relates to the percentage of mapped vegetation within a 1 km radius surrounding the AU that is remnant and/or regrowth, as opposed to non-remnant areas. The scoring thresholds relate to a 10-30% threshold of habitat loss within a landscape, below which species may be lost. All of the northern offset group AUs scored 5, being greater than 75% remnant vegetation within the surrounding areas. The central offset group AUs scored 4, due to containing greater areas of developed and non-remnant land within a 1 km radius. The southern offset group AUs were a mix of High or Very High categories, with the scores for koala and black-breasted button-quail AUs being the same. These results are shown in Table 4.5.

Table 4.5 Landscape context results

Assessment unit	Context	Score
N1	89.81 % remnant	5
N2	82.13 % remnant	5
N3	80.77 % remnant	5
N4	76.00 % remnant	5
N5	75.81 % remnant	5
N6	81.03 % remnant	5
N7	89.35 % remnant	5
N8	82.61 % remnant	5
N9	95.18 % remnant	5
C1	44.39 % remnant	4
C2 (Alt)	54.69 % remnant	4
S1*	69.97% remnant	4
S2*	67.65 % remnant (67.11 % remnant*)	4
S3	78.20 % remnant	5
S4*	74.46 % remnant (73.77 % remnant*)	4
S5	77.85 % remnant	5
S6*	74.80 % remnant (73.73 % remnant*)	4
S7	58.29 % remnant	4

* Only these AUs also relate to black-breasted button-quail offset areas (with any differing results marked with *)

4.1.3 Koala habitat scores

4.1.3.1 Quality of foraging habitat

Scores out of 10 for the quality of koala foraging habitat had not improved substantially since the baseline monitoring event in 2020. Scores ranged between 0.7 and 8.3 with a slight increase in average score of 4.21 (from 4.17). This was not unexpected given there has been insufficient time to achieve a notable increase in the abundance of food tree species at sparsely vegetated sites (i.e. AU N1-1, AU N9-1 and AU S5-1) (Plate 4-1). Weed management activities, anticipated to increase the foraging quality of other sites that are extensively infested with *Lantana camara* (i.e. AU-N2-1, N3-1, N3-2, N4-2, N6-2 and N7-3) have also not yet been achieved.

Plate 4-1 Low foraging habitat quality sites AU N9-1 (left) and AU N1-1 (right)

4.1.3.2 Quality of shelter

Scores out of 10 for the quality of shelter for koalas have improved slightly since the baseline monitoring event, ranging between 0 and 8.6 with an average score of 5.5 (increasing from 4.32 in the baseline). The improvement is primarily due to the increase in sub-canopy shelter scores. As detailed in the baseline, most sites have moderate to high shelter scores, with a small number of relatively cleared sites (i.e. AU N1-1, AU N9-1), accounting for very low shelter scores. Growth of vegetation in those assessment units will account for the majority of improvements in habitat value over time. Condition sites with higher scores for koala shelter (i.e. AU S1 and AU S2-2) had high levels of vegetation in the shrub and sub-canopy layers, as shown in Plate 4-2.

Plate 4-2 High quality shelter sites AUS1 (left) and AUS2-2 (right)

4.1.3.3 Threats to species

Koala offset areas generally had low baseline threat levels from dogs and vehicles, particularly in the extensively vegetated Curra State Forest area at the north. Prior to development, proximity to rural residential housing would have imposed a low-moderate level of threat from dog attacks. Construction of the project and installation of perimeter fencing has reduced local access to domestic dogs, thereby reducing the localised threat of dog attacks. This reduction was only likely in the northern assessment unit, as the central and southern units are still in close proximity to rural residential housing. Combined threat scores for the northern assessment units declined, due to the reduction in dog attacks, with the threat of vehicle collision remaining low. Overall threat scores ranged between 6.5 and 9, the average score was 8.09, indicating a low level of threat to koalas. This was slightly higher average absence of threat score than the baseline score of 6.04.

4.1.3.4 Species mobility

Scores out of 10 for koala mobility ranged between 1.3 and 8.6, with an average score of 6.01, (slightly lower than the 6.14 recorded in the baseline). The two sites generally lacking any canopy trees (AU N1-1 and AUN9-1) had low mobility scores, as koalas would need to walk at ground level through those areas, increasing the energetic cost of movement and susceptibility to dog attack. As observed during the baseline monitoring, areas with high densities of *Lantana camara* (i.e. AU N6-2, AU N7-3, AU C2-1 and AU S3-1), as shown in Plate 4-3, also had

reduced mobility scores due to the physical barrier posed by the weed species. The barriers imposed by Lantana infestation have worsened slightly, ahead of proposed weed management. No sites had physical barriers that would entirely restrict mobility. Koala-exclusion fencing limits westerly movement of koalas at sites in Woondum State Forest, however these sites were well-connected to larger areas of habitat to the east. While areas with high densities of woody weeds would not present a barrier to koala movement, they are likely to increase the energetic costs associated with moving through those areas and were scored down accordingly.

Plate 4-3 Low mobility sites for koala AU N6-2 (left) and AU C2-1 (right)

4.1.3.5 Species stocking rate

Koalas were assigned a species stocking rate score of 40 out of 70 for all AUs combined to represent the local population as a whole. Scoring for each criterion is shown in Table 4.6 below. Presence and density data is further discussed in Section 4.2.

Table 4.6 Scores for koala species stocking rate

Criteria	Score			
Presence detected on or adjacent to the site	0	5		10
	No	Yes - adjacent		Yes – on site
Species usage of the site	0	5	10	15
	Not habitat	Dispersal	Foraging	Breeding
Approximate density score*	0	10	20	30
	0	0 – 0.06	0.6 - 5	>5
Role/importance of species population on site	0	5	10	15
	0	5 - 15	20 - 35	40 - 45

*Note: this is multiplication of the estimated density from drone survey and localised utilisation from SAT scores and does not represent a density per ha score.

4.1.3.6 Role/importance of the site to the species population

The offset areas as a whole were assigned a score of 15 out of 45 for their importance to the species population using the criteria detailed in Table 4.7. The offset areas were considered key source populations for breeding and dispersal but were not near the limit of the species range and were not considered necessary for maintaining genetic diversity given they are connected to large areas of woodland that would otherwise support koalas from genetically similar populations.

Table 4.7 Role/importance of the species population

Criteria	Score	
Key source population for breeding	0	10
	No	Yes/Possibly
Key source population for dispersal	0	5
	No	Yes/Possibly
Necessary for maintaining genetic diversity	0	15
	No	Yes/Possibly
Near the limit of the species range	0	15
	No	Yes

4.1.4 Black-breasted button-quail habitat scores

4.1.4.1 Quality of foraging habitat

Scores out of 10 for the quality of foraging habitat ranged between 2 and 5.25 with an average score of 3.50, slightly lower than the baseline average score of 4.48. The reduction in scoring of foraging habitat value was attributed to a reduction in leaf litter depth and cover, due to overland flows experienced during recent flood events in February 2022. This impacted lower-lying sites (i.e. AU S1-1, AU S2-1 and AU S6-1), more substantially than those at higher levels (i.e. AU S4-1 and AU S4-3). Photos of sheet erosion at AUS1-1 and AU S2-1 are shown in Plate 4-4 and Plate 4-5.

Plate 4-4 Erosion impacting leaf litter and subsequent foraging value for black-breasted button quail (AU S1-1)

Plate 4-5 Flood damage at AU S2-1 impacting on black-breasted button-quail foraging habitat

4.1.4.2 Quality of shelter

Scores out of 10 for the quality of shelter for black-breasted button-quails ranged between 3.9 and 6.3 with an average score of 5.15, slightly higher than the baseline average of 4.36. There was no material improvement in the shelter values across all sites. Lantana densities were not observed to have substantially changed. This does provide a level of shelter in some sites and needs to be removed only once native cover is increased locally. Similarly to observations in the baseline survey, condition sites with lower shelter values (i.e. AU S4-3, AU S6-1) generally had patchily distributed shrub and sub-canopy cover. Condition sites with higher shelter scores (i.e. AU S2-1 and AU S2-2) had high levels of vegetation in the shrub and sub-canopy layers, as shown in Plate 4.6.

Plate 4-6 Sites with higher shelter values for black-breasted button-quail - AU S2-1 (left) and AU S2-2 (right)

4.1.4.3 Threats to species

There was no substantial change in the level of threat faced by the local black-breasted button-quail population by wild cats or vehicles. Offset areas generally had relatively moderate-high existing threats, ranging from 2 to 6 with an average absence of threat score of 3.57, slightly higher than the baseline score of 3.25 out of 10 (where 10 is a low-threat site). Existing threats were attributed to the relatively small size of patches and proximity to urban areas which would increase threats to the local population from cat predation and bushfire. Threats from vehicle movements were generally considered low.

4.1.4.4 Species mobility

Species mobility scores remain unchanged since the baseline. Clearing for the project has not substantially restricted local movement opportunities and there has been no substantial change in the level of vegetation cover that could limit local movement. Scores out of 10 for species mobility ranged between 2 and 6, with an average score of 4.38. Sites with high levels of localised connectivity, afforded by consistent shrub and sub-canopy cover (AU S2-1 and AU S2-2) (Plate 4-6) had high mobility scores, providing increased opportunities for localised movement.

Plate 4-7 Sites with high local mobility scores AU S2-1 (left) and AU S2-2 (right)

4.1.4.5 Species stocking rate

Black-breasted button-quails were assigned a species stocking rate score of 55 out of 70 for all AUs. Scoring for each criterion is shown in Table 4.8. Presence and density data is further discussed in Section 4.3.

Table 4.8 Scores for black-breasted button-quail species stocking rate

Criteria	Score			
Presence detected on or adjacent to the site	0	5		10
	No	Yes - adjacent		Yes – on site
Species usage of the site	0	5	10	15
	Not habitat	Dispersal	Foraging	Breeding
Approximate density score*	0	10	20	30
	Absent	Low (0 – 3 platelets / 50 m plot)	Medium (3 – 6 platelets / 50 m plot)	High (> 6 platelets / 50 m plot)
Role/importance of species population on site*	0	5	10	15
	0	5 - 15	20 - 35	40 - 45

**Note: this represents an indirect index of activity based on the number of platelets found per 50 m BioCondition plot and does not represent a density per ha score.*

4.1.4.6 Role/importance of the site to the species population

The offset areas as a whole were assigned a score of 30 out of 45 for their importance in the population of the species using the criteria detailed in Table 4.9. As the population occupying the offset areas are part of a broader population in Woondum State Forest that is isolated from other areas of suitable habitat, it was considered likely to be part of a key source population for breeding and dispersal and necessary for maintaining genetic diversity in the species.

Table 4.9 Role/importance of the species population in the offset area

Criteria	Score	
Key source population for breeding	0	10
	No	Yes/Possibly
Key source population for dispersal	0	5
	No	Yes/Possibly
Necessary for maintaining genetic diversity	0	15
	No	Yes/Possibly
Near the limit of the species range	0	15
	No	Yes

4.1.5 Habitat quality scores

The habitat quality scores (weighted by area) resulting from the results of the biennial survey have been calculated as:

– Koala offset areas scored 6.12 (slightly higher than the baseline score of 6.07)
– Black-breasted button-quail offset areas scored 6.75, (slightly lower than the baseline score of 6.92)

The results for each species are shown in the Modified QLD Habitat Quality spreadsheet in Appendix A.

It is noted that the required legally secured koala offset area in the approval conditions (post-approval variation notice) is 280.36 ha, while the total area assessed for habitat quality in the designated assessment units during the baseline surveys was 287.23 ha. The required black-breasted button-quail offset area in the approval conditions is

32.15 ha, while the total area assessed for habitat quality in the designated assessment units during the baseline surveys was 32.65 ha.

4.2 Koala presence

4.2.1 Drone surveys of koala density

The USC thermal drone surveys detected nine koalas in bushland within and immediately adjacent to the offset area. This was consistent with the results of the baseline survey, with nine individual koalas recorded in and immediately adjacent to the offset area (and an additional five koalas recorded in the broader landscape) in the baseline. Koala density estimates for the northern, central and southern offsets areas are detailed in

Table 4.10. Koala densities have remained the same between both surveys, consistent with east coast low density populations, defined as < 0.1 koala/ha in Phillips and Callaghan (2011).

Table 4.10 Koala densities in each offset assessment unit

Offset area group	Area	Baseline survey 2020		Current survey 2022	
		Number of koalas	Density (koala/ha)	Number of koalas	Density (koala/ha)
North	190.6	2	0.011	2	0.011
Central	44.2	2	0.045	2	0.045
South	45.18	5	0.11	5	0.11

4.2.2 SAT surveys of local koala utilisation

Searches for koala faecal pellets using SAT surveys detected koalas from seven out of the 26 assessment unit sites. This result was less than the number of sites (i.e. 11 sites) at which koalas were detected during the baseline surveys.. Of the seven sites at which koalas were detected, scats were observed at only two (C1-1 and S4-2), with the remaining five sites showing recent confirmed koala scratches. This result may be attributed to the significant rainfall events which occurred within Gympie in the month's leading up to the biennial monitoring event. Significant rainfall event and localised flooding has the potential to either wash away or degrade koala scat making it undetectable in the field.

Based on the framework for koala utilisation provided for east coast 'medium – high' density koala populations in Phillips and Callaghan (2011), the monitoring results recorded during the biennial monitoring event were consistent with 'low' levels of koala utilisation, with koala scats detected under 1 – 22.52% of trees searched in SAT surveys. The utilisation levels as per the definitions provided by Phillips and Callaghan (2011) are replicated below for reference:

– Low use: <22.52%
– Medium (normal) use: >22.52 % but < 32.84%
– High use: >32.84%

The results of SAT searches are detailed in Table 4.11 and shown in Plate 4-8 and 4-9 as evidence of koalas. The location of koala records in 2022 is mapped in Figure 4.8.

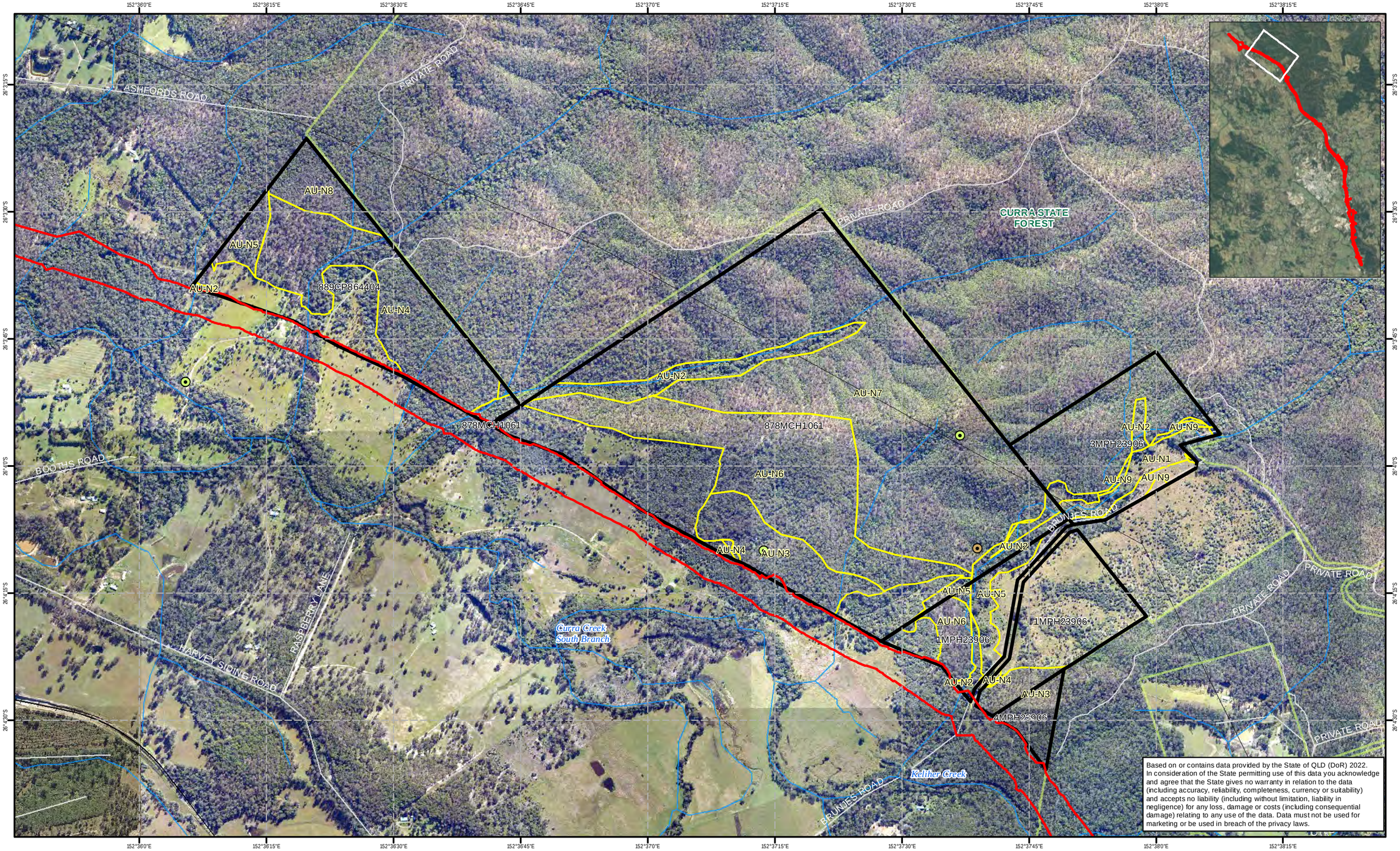
Table 4.11 Koala utilisation levels based on SAT search results

Assessment unit	Baseline SAT results (2020)	Proportion	Baseline utilisation level (2020)	2022 SAT results	Proportion	2022 utilisation level
AU N4-1	1/30	3.3%	Low	0/30	0%	Absent
AU N5-1	1/30	3.3%	Low	0/30	0%	Absent
AU N7-1	2/30	6.7%	Low	0/30	0%	Absent
AU N7-2a	0/30	0%	Absent	1/30	3.3%	Low

Assessment unit	Baseline SAT results (2020)	Proportion	Baseline utilisation level (2020)	2022 SAT results	Proportion	2022 utilisation level
AU N7-3	1/30	3.3%	Low	0/30	0%	Absent
AU C1-1	1/30	3.3%	Low	0/30	0%	Absent
AU-C2-1	0/30	0%	Absent	4/30	13.3%	Low
AU C1-2	2/30	6.7%	Low	1/30	3.3%	Low
AU S1-1	7/30	23.3%	Medium	1/30	3.3%	Low
AU S2-1	5/30	16.7%	Low	4/30	13.3%	Low
AU S2-2	7/30	23.3%	Medium	0/30	0%	Absent
AU-S3-1	0/30	0%	Absent	1/30	3.3%	Low
AU S4-2	1/30	3.3%	Low	1/30	3.3%	Low
AU S7-1	2/30	6.7%	Low	0/30	0%	Absent

Plate 4-8 Koala scats recorded in SAT searches within the offset area in 2022

Plate 4-9 Koala scratches recorded in SAT searches within the offset area in 2022



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LEGEND

- Drone Detected Koala
- Koala on Remote Camera
- Koala Scat
- Koala scratch
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Koala Assessment Units

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Distribution of koalas recorded during field surveys in 2022 - Northern Group

Job Number	12534030
Revision	A
Date	01 Jun 2022

Figure 4-6

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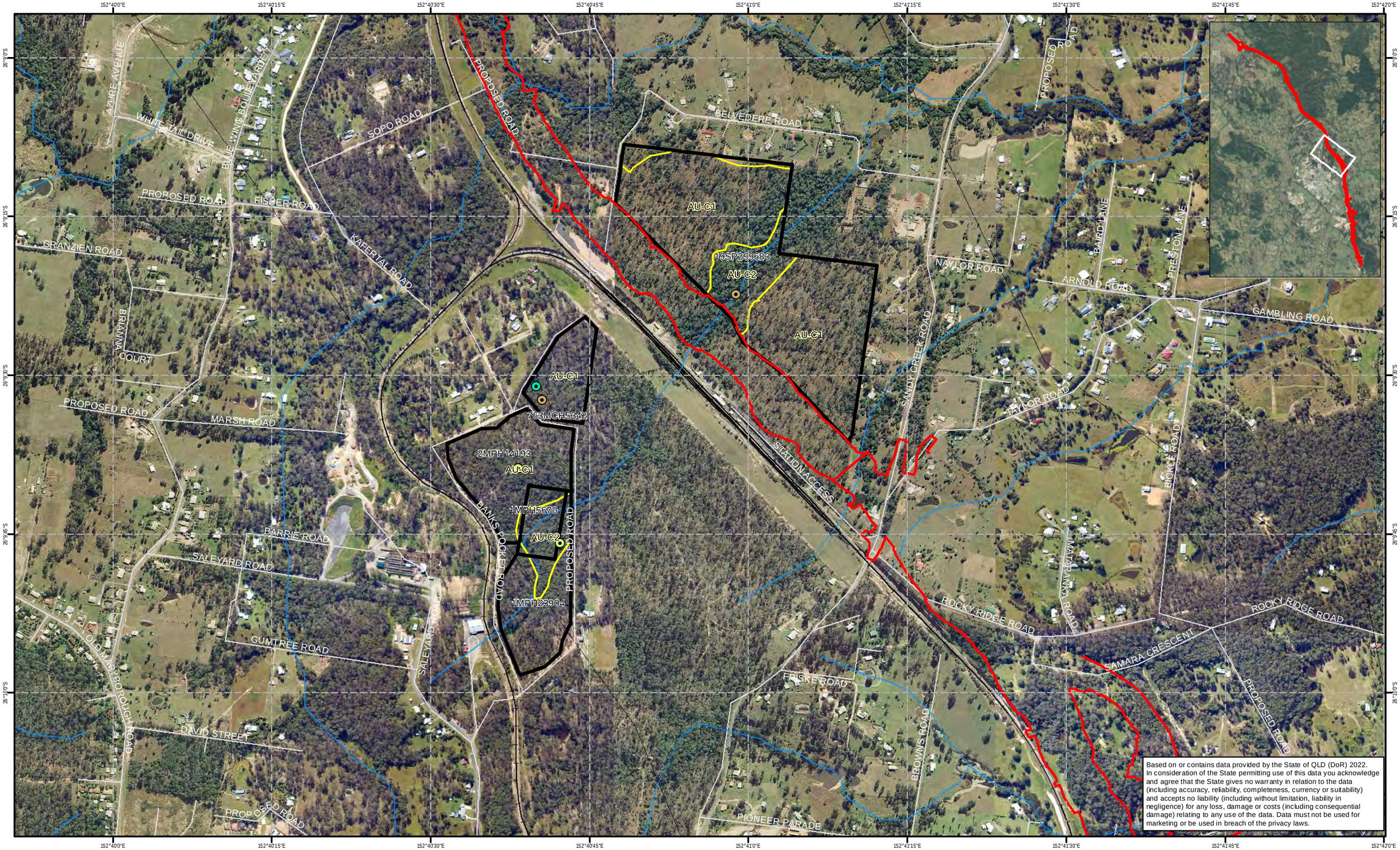

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LEGEND

- Drone Detected Koala
- Koala on Remote Camera
- Koala Scat
- Koala scratch
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Koala Assessment Units

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Distribution of koalas recorded during field surveys in 2022 - Central Group

Job Number	12534030
Revision	A
Date	01 Jun 2022

Figure 4-6

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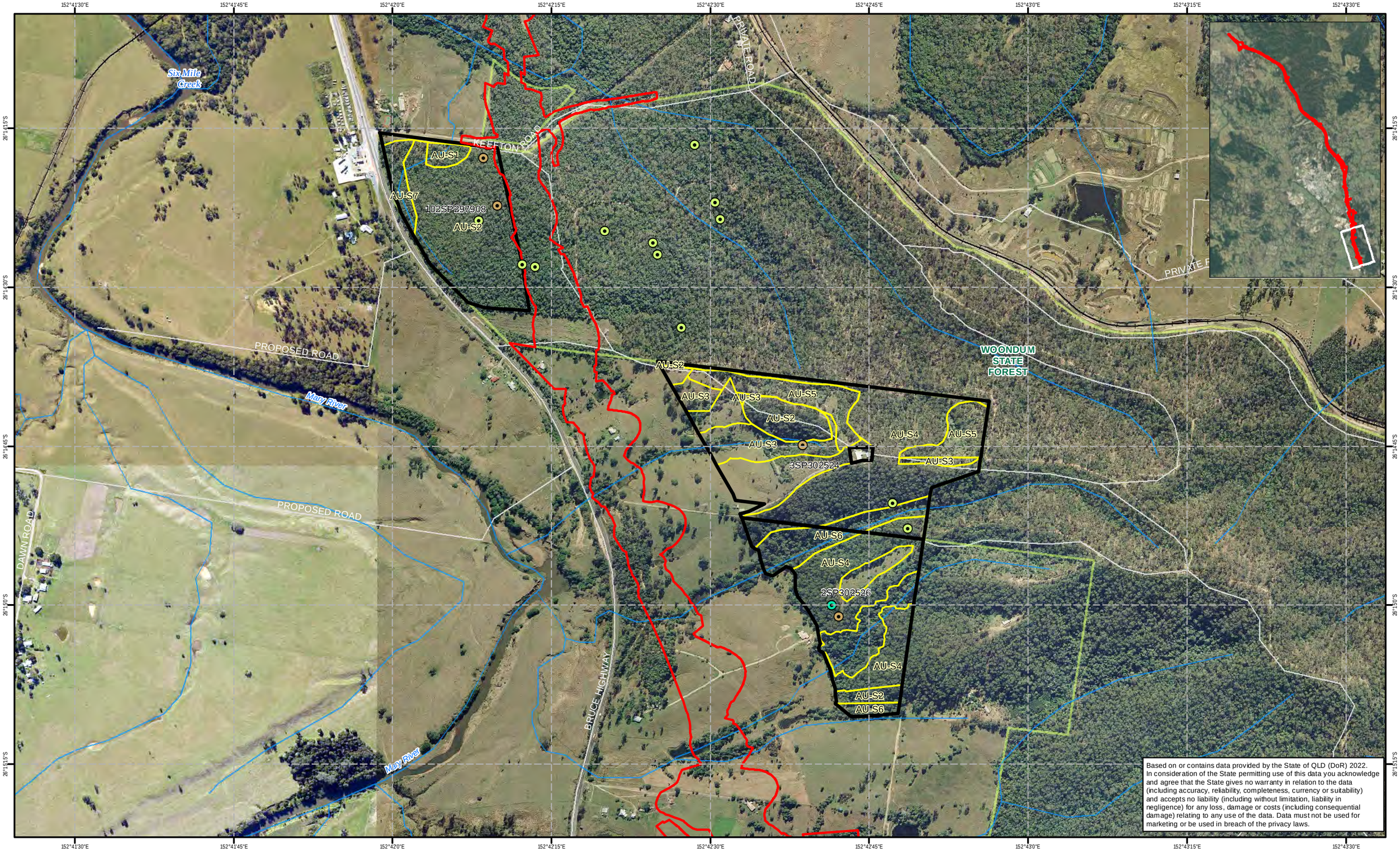

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LEGEND

- Drone Detected Koala
- Koala on Remote Camera
- Koala Scat
- Koala scratch
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- Koala Assessment Units

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Distribution of koalas recorded during field surveys in 2022 - Southern Group

Job Number	12534030
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Figure 4-6
Page 3 of 3

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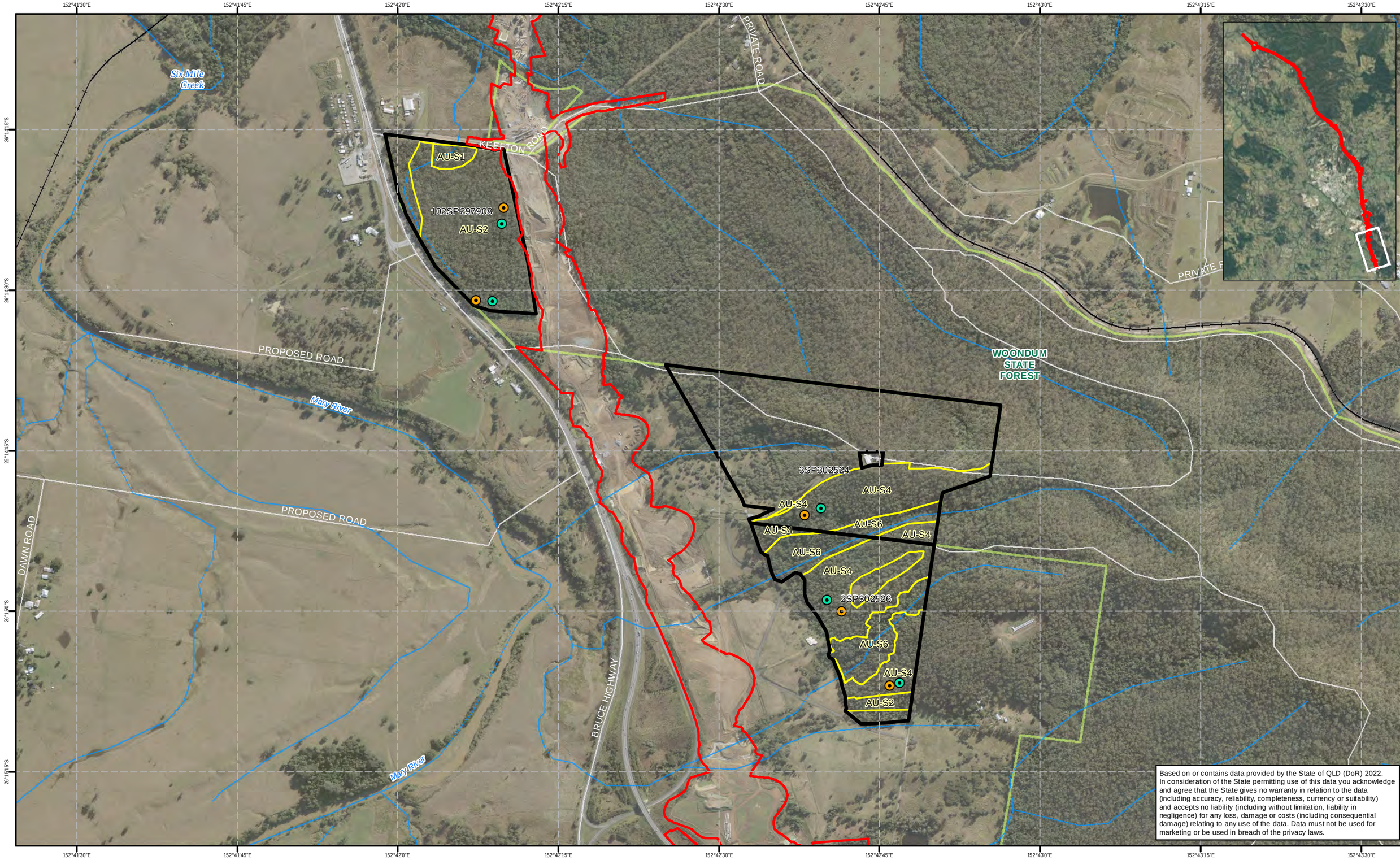
4.3 Black-breasted button-quail presence

The black-breasted button-quail was confirmed present from five locations within the southern offset areas. These were located in assessment units AU S2-1, AU S2-2, AU S4-1, AU S4-2 and AU S4-3. The species was positively identified from characteristic scats (Plate 4-10) observed adjacent to platelets (Plate 4-11) in five locations shown on Figure 4-9. Platelet counts were used as the basis for estimating the relative densities of black-breasted button-quails at each assessment site. The highest densities of platelets were observed at the more elevated sites. These are likely to have received less overland flow than lower-lying sites such as AU S1-1 and AU S2-1. No black-breasted button-quails were recorded on remote surveillance cameras. For logistic reasons the cameras were set for a much shorter period of time (4 days) than in the baseline monitoring assessment (9 days). While the observation of faecal pellets confirmed the species presence, standardised deployment of remote cameras is recommended to provide consistency between monitoring events.

Plate 4-10 Faecal scat of the black-breasted button-quail observed at AU S2-1

Plate 4-11 Black-breasted button-quail platelets at AU S4-1 (left) and AU S4-2 (right)



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LEGEND

- BBBQ Platelets
- BBBQ Scat
- Watercourses
- Railway
- Road/Track
- Project Footprint
- State Forest
- Offset Areas
- BBBQ Assessment Units

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Distribution of black-breastedbutton-quails recorded in 2022 Southern Group

Job Number	12534030
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Figure 4-7

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5. Weed infestation

5.1 Weed densities

Of the 40 weed monitoring quadrats assessed in 2022, almost half (N=19) had combined covers[4] of target weed species of 50% or greater, with five of those exceeding 80% (namely N6-2, C1-1, C2-2, S2-2, S4-2 and S5-1). The most common target weeds observed across monitoring quadrats in the 2022 monitoring event were *Lantana camara* and *Passiflora suberosa*. Only five quadrats had combined weed covers of less than 10% (namely, N3-1, N9-1, C1-4, S1-1 and S2-1). Target weed densities recorded within monitoring quadrats during the 2022 monitoring event are provided in Table 5.1.

[4] Combined density is the addition of recorded percentage covers of all target weed species. It is possible that combined weed cover may exceed 100% where target weeds overlap each other within a quadrat.

Table 5.1 Cover of target weed species recorded in weed monitoring quadrats in the 2022 monitoring event

Quadrat	Target weed species (% cover)																			Combined cover (%)
	A.aethiopicus	*A.plumosus*	*B.halimifolia*	*C.sinensis*	*C.camphora*	*E.uniflora*	*D.unguis-cati*	*L. camara*	*M.maximus*	*O.serrulata*	*P.mandiocanum*	*P.suberosa*	*P.subpeltata*	*P.edulis*	*S.pendula*	*S.occidentalis*	*S.torvum*	***S. trilobata***	*Sporobolus* **spp.**	
N1-1					4											2				
N2-1								30	10			12								52
N3-1							20	1			0.5								26.5	5
N3-2								55												58
N4-1							1	35			4	5								41
N4-2							0	27			3		3	2		1				
N4-3								9	20											33
N5-1								42			5	0.5							36	42.5
N6-1								25			4								0.5	30.5
N6-2								20	80											108
N6-3								20			5	30								50
N6-4								30			8	0.5								30.5
N7-1								17												23
N7-2								20												21
N7-3								60			6									65
N7-4								55			1									63
N7-5								72			5									77
N7-6								75			8									80
N7-7								25			5	12								37
N7-8								35			5									38
N7-9								55												60
N7-10								45			3									50
N8-1								20			5									21

Quadrat	Target weed species (% cover)																			Combined cover (%)
	A.aethiopicus	*A.plumosus*	*B.halimifolia*	*C.sinensis*	*C.camphora*	*E.uniflora*	*D.unguis-cati*	*L. camara*	*M.maximus*	*O.serrulata*	*P.mandiocanum*	*P.suberosa*	*P.subpeltata*	*P.edulis*	*S.pendula*	*S.occidentalis*	*S.torvum*	***S. trilobata***	*Sporobolus* **spp.**	
N9-1																				0
C1-1																		90		90
C1-2								55				0.5								55.5
C1-3							7	25		4		6								42
C1-4							2	3		2	0.5	2								
Alt C2-1								30				10								40
C2-2				3						5			1						9	89
S1-1				7			0.5													7.5
S2-1							65	1						15	0.5					1.5
S2-2							5	35				25								65
S2-3				2			2	22	2	1										59
S3-1					18			20												42
S4-1							2	45	2		30	10								59
S4-2		0.5					70	8			4									
S5-1								85												87
S6-1							5	70											81.5	79
S7-1	0.5			20		0.5		1		0.5	2	0								37.5
										3	4									

5.2 Baseline data comparison

The majority of the weed monitoring quadrats assessed[5] showed no substantial change in combined densities of target weed species when compared to the 2020 baseline monitoring event (whereby a substantial change was considered to be an increase or decrease of 20 percentage points or greater). Slightly more than half (56%) of the substantial changes were attributed to increases in combined weed densities rather than decreases. Combined target weed densities for respective quadrats in 2020 and 2022, together with the observed change in densities is shown in Table 5.2.

To provide evidence of substantial changes of both increases and decreases in weed densities comparison photographic evidence has been provided in Appendix D. Photographs provided have been taken from the same photo reference point and from the same aspect as the baseline monitoring event.

Table 5.2 Changes in combines densities of target weed species between 2020 and 2022

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
N1-1	29	26.5	-2.5
N2-1	50	52	2
N3-1	84	5	-79
N3-2	52	58	6
N4-1	40	41	1
N4-2	49	36	-13
N4-3	28	33	5
N5-1	50	42.5	-7.5
N6-1	38	30.5	-7.5
N6-2	105	108	3
N6-3	55	50	-5
N6-4	45	30.5	-14.5
N7-1	30	23	-7
N7-2	21	21	0
N7-3	48	65	17
N7-4	45	63	18
N7-5	55	77	22
N7-6	59	80	21
N7-7	53	37	-16
N7-8	25	38	13
N7-9	80	60	-20
N7-10	22	50	28
N8-1	31	21	-10
N9-1	4	0	-4
C1-1	70	90	20
C1-2	37	55.5	18.5
C1-3	47	42	-5

[5] Note: Quadrat C2-1 was relocated due to access/construction constraints. Weed densities were recorded with the alternate C2-1 during the current monitoring event but results are not reported on here due to a lack of comparative baseline data.

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
C1-4	80	9	-71
C2-2	84	89	5
S1-1	19	7.5	-11.5
S2-1	69	1.5	-67.5
S2-2	57	65	8
S2-3	51	59	8
S3-1	30	42	12
S4-1	47	59	12
S4-2	66	81.5	15.5
S5-1	87	87	0
S6-1	54	79	25
S7-1	56	37.5	-18.5
Green shading – substantial decrease in combined weed densities Red shading – substantial increase in combined weed densities			

6. Progress towards ecological outcomes

The following section has been developed to report on the progress towards achieving the ecological outcomes required by Condition 12 of the EPBC 2017/7941 for habitat quality, threat reduction and presence for the koala and black-breasted button-quail within the offset areas.

The following

6.1 Koala habitat value and density

The 2022 monitoring event has recorded minor improvements in habitat value for both the koala and the black-breasted button-quail. This outcome is consistent with expectations, given the early stage of the delivery of the offset obligations and commencement of active management actions.

There has been some minor improvement in koala habitat value. This was driven by a reduction in dog predation risk due to the removal of rural residential blocks adjacent to the northern assessment unit and the erection of construction exclusion fencing along much of the projects' length.

While improvements in koala habitat values are anticipated through the life of the offset, most improvements are yet to be achieved and are reliant on active management. Increased recruitment of koala food trees is expected in assessment units with low tree densities (i.e. AU N1 -1, N9-1) and koala mobility can be improved by removing weeds from areas degraded with dense *Lantana camara* and cats claw creeper. However minimal improvement has been achieved to date. The weed management and active planting is not yet at a scale that has achieved significant habitat improvements. Increased weed management is critical to achieve these goals in the short to mid term. Similarly natural recruitment and planting of trees is needed to accelerate the recruitment of koala food trees.

Koala density remained stable with that recorded in the baseline survey, with koala densities remaining consistent at levels equivalent to east coast low density populations (i.e. < 0.1 koala/ha). As koala density (i.e. number of koalas / ha) is dependent on regional factors that are largely beyond the influence of the offset area, and limited by the carrying capacity of koala habitats within the surrounding landscape, it is unlikely to increase dramatically over the life of the offset. Instead, achieving a 50% increase in koala density as required in Condition 12e is likely to be achieved in terms of an increase in koala *habitat utilisation* (i.e. an increase in the area of land that is actively utilised by koalas), as indicated by SAT scores. While this is a more realistic measure of offset success, koala utilisation scores were substantially reduced from the levels recorded in the baseline survey. This was likely due to the recent flooding event which would have washed away many koala faecal pellets. Given koala densities recorded using thermal drones have not changed from the baseline - the low utilisation scores are likely due to the reduced faecal pellet detectability rather than any reduction in utilization or local koala density.

6.2 Black-breasted button-quail habitat value and density

The habitat values for the black-breasted button-quail were reduced from those recorded in the baseline monitoring event in 2020. This is a direct result of the recent flooding event which has caused substantial scouring of the understory with reductions in leaf litter at a number of the assessment sites. Sites at low elevation, close to watercourses were particularly impacted. Importantly the black-breasted button quail was confirmed present within five assessment units within the offset area - with numbers of platelets and faecal pellets observed throughout the extent of the offset areas. Increased black-breasted button-quail foraging activity was observed at higher elevation sites - suggesting black-breasted button quails have moved to higher ground to avoid flooding and take advantage of better foraging values in areas that retain deeper leaf litter and cover. The reduction in activity at low level sites is expected to be a short-term phenomena, with the shrub and canopy unimpacted by the flooding and likely to retain their shelter and foraging habitat values once leaf litter accumulates and associated invertebrate communities recover within the ground layer.

As with the koala – active weed management at black-breasted button quail sites has yet to be progressed substantially. Weed management needs to be combined with strategic planting to remove weeds whilst maintaining shrub and understory cover.

6.3 Habitat quality

6.3.1 BioCondition

The overall average BioCondition score (i.e. across all AUs) increased from 43.9 (out of a possible 80) in 2020 to 48.8 in 2022. Further interrogation of the data reveals that all but one AU recorded an improvement in the BioCondition score when compared to baseline data. AUS6 was the exception, whereby the BioCondition score dropped from 51.1 to 41.3.

Whilst this overall result is encouraging, 5 out of 13 attributes showed no improvement in the average relative score compared to baseline data. This is in part a reflection of the high baseline scores recorded for several attributes, suggesting there is limited capacity for improvement of these attributes over time. By way of example, litter cover received the maximum average score of 5 in 2020. The score dropped to 4.35 in 2022, which is largely a consequence of increased native perennial grass cover in plots (overlying the litter). Non-native cover and the number of large trees were two attributes possessing the greatest capacity for improvement. However, any increase in the number of large trees is likely to be gradual and measurable improvements may not be realised within the timeframe of the monitoring program. Therefore, the greatest area for improvement lies within the removal of non-native cover (i.e. active weed management).

6.3.2 Weed infestation

The average combined cover of target weeds across all monitoring quadrats decreased from 50.28% in 2020 to 47.31% in 2022. This represents a 5.89% reduction from baseline levels.

Of the 40 weed monitoring quadrats assessed, less than half (N=18) showed any reduction in combined cover of target weeds, with only 4 quadrats exhibiting a substantial reduction in cover (i.e. decrease of at least 20% cover compared to baseline data). These results indicate that the following 2 years prior to the Year 3 Biennial Monitoring Event should increase the level of active weed management within the offset sites.

Appendices

Appendix A

Modified QLD Habitat Quality Sheet for Koala

OFFSET - Fauna Species KOALA

Assessment Unit - Regional Ecosystem	AU N1 - RE 12.3.11 Regrowth						AU N2 - RE 12.3.11 Remnant						AU N3 - RE 12.9-10.17b Remnant							
Site Reference	Benchmark	Site 1 (N1 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (N2 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (N3 - 1)			Site 2 (N3 - 2)			Average Score
	12.3.11	Raw Data	% Benchmark	Score			12.3.11	Raw Data	% Benchmark	Score			12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	
Site Condition																				
Recruitment of woody perennial species in EDL	100	100	100.0	5	100	5	100	100	100.0	5	100	5	100	100	100.0	5	50	50.0	3	4
Native plant species richness - trees	7	10	142.9	5	142.9	5	7	18	257.1	5	257.1	5	10	10	100.0	5	14	140.0	5	5
Native plant species richness - shrubs	7	1	14.3	0	14.3	0	7	13	185.7	5	185.7	5	5	6	120.0	5	7	140.0	5	5
Native plant species richness - grasses	12	4	33.3	2.5	33.3	2.5	12	3	25.0	2.5	25	2.5	6	6	100.0	5	9	150.0	5	5
Native plant species richness - forbes	25	12	48.0	2.5	48	2.5	25	8	32.0	2.5	32	2.5	17	15	88.2	2.5	15	88.2	2.5	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			1.5	13.1	1.5	0			5	120.9	5	0			4			4	4
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			1	17	1	0			4	164.3	4	0			2.5			5	3.8
Shrub canopy cover	20	0.5	2.5	0	2.5	0	20	5	25.0	3	25	3	27	10	37.0	3	15	55.6	5	4
Native grass cover	44	15	34.1	1	34.1	1	44	71	161.4	5	161.4	5	35	17	48.6	1	3.4	9.7	0	0.5
Organic litter	37	36	97.3	5	97.3	5	37	17	45.9	3	45.9	3	55	17	30.9	3	53	96.4	5	4
Large trees (euc plus non-euc)	30	0	0.0	5	0	5	30	1	3.3	5	3.3	5	30	6	20.0	5	8	26.7	5	5
Coarse woody debris	555	0	0.0	0	0	0	555	120	21.6	2	21.6	2	401	550	137.2	5	1000	249.4	2	3.5
Non-native plant cover	0	20	20.0	5	20	5	0	50	50.0	0	50	0	0	50	50.0	0	70	70.0	0	0
Quality and availability of food and foraging habitat				2		2				2.8		2.8				4.4			4.2	4.3
Quality and availability of shelter				1		1				6.8		6.8				3.1			4.7	3.9
Site Condition Score				36.5		36.5				56.6		56.6				53.5			55.4	54.5
MAX Site Condition Score				*100*		*100*				*100*		*100*				*100*			*100*	*100*
Site Condition Score - out of 3						**1.10**						**1.70**								**1.64**
Site Context																				
Size of patch				10		10				10		10				10			10	10
Connectedness				2		2				4		4				4			4	4
Context				5		5				5		5				5			5	5
Role of site location to species overall population in the state				1.6		1.6				2.5		2.5				4.1			4.1	4.1
Threats to the species				7.3		7.3				8.3		8.3				8.3			8.3	8.3
Species mobility capacity				2.7		2.7				7.7		7.7				7			6	6.5
Site Context Score				28.6		28.6				37.5		37.5				38.4			37.4	37.9
MAX Site Context Score				*56*		*56*				*56*		*56*				*56*			*56*	*56*
Site Context Score - out of 3						**1.53**						**2.01**								**2.03**

Assessment Unit - Regional Ecosystem	AU N4 - RE 12.9-10.17b Remnant									AU N5 - RE 12.9-10.17b Regrowth						AU N6 - RE 12.9-10.17b Remnant								
Site Reference	Benchmark	Site 1 (N4 - 1)			Site 2 (N4 - 2)			Average % benchmark	Average Score	Benchmark	Site 1 (N5 - 1)			Average % benchmark	Average Score	Benchmark	Site 1a (N6 - 1a)			Site 2 (N6 - 2)			Average % benchmark	Average Score
	12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score			12.9-10.17b	Raw Data	% Benchmark	Score			12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score		
Site Condition																								
Recruitment of woody perennial species in EDL	100	100	100.0	5	75	75.0	5	87.5	5	100	100	100.0	5	100	5	100	60	60.0	3	75	75.0	5	67.5	4
Native plant species richness - trees	10	10	100.0	5	13	130.0	5	115	5	10	10	100.0	5	100	5	10	13	130.0	5	15	150.0	5	140	5
Native plant species richness - shrubs	5	6	120.0	5	8	160.0	5	140	5	5	10	200.0	5	200	5	5	6	120.0	5	8	160.0	5	140	5
Native plant species richness - grasses	6	8	133.3	5	9	150.0	5	141.7	5	6	12	200.0	5	200	5	6	9	150.0	5	9	150.0	5	150	5
Native plant species richness - forbes	17	18	105.9	5	14	82.4	2.5	94.2	3.8	17	24	141.2	5	141.2	5	17	14	82.4	2.5	10	58.8	2.5	70.6	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5	88.2	5	0			4	77.8	4	0			4			4	70.6	4
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			5			5	98	5	0			3.5	116.4	3.5	0			5			4	142.2	4.5
Shrub canopy cover	27	9	33.3	3	6	22.2	3	27.8	3	27	11	40.7	3	40.7	3	27	8	29.6	3	5	18.5	3	24.1	3
Native grass cover	35	49	140.0	5	6	17.1	1	78.6	3	35	49.6	141.7	5	141.7	5	35	6	17.1	1	3	8.6	0	12.9	0.5
Organic litter	55	17	30.9	3	78	141.8	5	86.4	4	55	35	63.6	5	63.6	5	55	44	80.0	5	64	116.4	5	98.2	5
Large trees (euc plus non-euc)	30	11	36.7	5	5	16.7	5	26.7	5	30	0	0.0	5	0	5	30	6	20.0	5	6	20.0	5	20	5
Coarse woody debris	401	140	34.9	2	600	149.6	5	92.3	3.5	401	570	142.1	5	142.1	5	401	1170	291.8	2	240	59.9	5	175.9	3.5
Non-native plant cover	0	25	25.0	3	48	48.0	3	36.5	3	0	20	20.0	5	20	5	0	35	35.0	3	25	25.0	3	30	3
Quality and availability of food and foraging habitat				7.5			4.7		6.1				5.7		5.7				6.1			4.8		5.5
Quality and availability of shelter				3.1			5.2		4.2				4.7		4.7				5.2			6.5		5.9
Site Condition Score				66.6			64.4		65.6				70.9		70.9				59.8			62.8		61.4
MAX Site Condition Score				*100*			*100*		*100*				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3									**1.97**						**2.13**									**1.84**
Site Context																								
Size of patch				10			10		10				10		10				10			10		10
Connectedness				2			2		2				2		2				4			4		4
Context				5			5		5				5		5				5			5		5
Role of site location to species overall population in the state				4.1			3.3		3.7				4.1		4.1				4.1			3.3		3.7
Threats to the species				8.3			8.3		8.3				9		9				8.5			9.5		9
Species mobility capacity				6.7			6.2		6.5				7		7				7			5.3		6.2
Site Context Score				36.1			34.8		35.5				37.1		37.1				38.6			37.1		37.9
MAX Site Context Score				*56*			*56*		*56*				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3									**1.90**						**1.99**									**2.03**

Assessment Unit - Regional Ecosystem	AU N7 - RE 12.11.5 Remnant												AU N8 - RE 12.11.5 Remnant						AU N9 - RE 12.11.5 Regrowth					
Site Reference	Benchmark	Site 1 (N7 - 1)			Site 2a (N7 - 2a)			Site 3 (N7 - 3)			Average % benchmark	Average Score	Benchmark	Site 1 (N8 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (N9 - 1)			Average % benchmark	Average Score
	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score			12.11.5	Raw Data	% Benchmark	Score			12.11.5	Raw Data	% Benchmark	Score		
Site Condition																								
Recruitment of woody perennial species in EDL	100	100	100.0	5	50	50.0	3	75	75.0	5	75	4.3	100	100	100.0	5	100	5	100	100	100.0	5	100	5
Native plant species richness - trees	7	10	142.9	5	14	200.0	5	12	171.4	5	171.4	5	7	10	142.9	5	142.9	5	7	4	57.1	2.5	57.1	2.5
Native plant species richness - shrubs	11	10	90.9	5	9	81.8	2.5	14	127.3	5	100	4.2	11	9	81.8	2.5	81.8	2.5	11	0	0.0	0	0	0
Native plant species richness - grasses	8	9	112.5	5	6	75.0	2.5	10	125.0	5	104.2	4.2	8	8	100.0	5	100	5	8	3	37.5	2.5	37.5	2.5
Native plant species richness - forbes	17	20	117.6	5	23	135.3	5	12	70.6	2.5	107.8	4.2	17	6	35.3	2.5	35.3	2.5	17	11	64.7	2.5	64.7	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5			5	82	5	0			5	113.4	5	0			1.5	12.5	1.5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			2.5			4			2.5	273	3	0			1.5	253.6	1.5	0			0	0	0
Shrub canopy cover	14	17	121.4	5	18	128.6	5	9	64.3	5	104.8	5	14	4	28.6	3	28.6	3	14	0	0.0	0	0	0
Native grass cover	30	5	16.7	1	5.8	19.3	1	19	63.3	3	33.1	1.7	30	14	46.7	1	46.7	1	30	66	220.0	5	220	5
Organic litter	50	72	144.0	5	63	126.0	5	52	104.0	5	124.7	5	50	72	144.0	5	144	5	50	4	8.0	0	8	0
Large trees (euc plus non-euc)	26	2	7.7	5	4	15.4	5	2	7.7	5	10.3	5	26	4	15.4	5	15.4	5	26	0	0.0	5	0	5
Coarse woody debris	457	750	164.1	5	520	113.8	5	750	164.1	5	147.3	5	457	110	24.1	2	24.1	2	457	0	0.0	0	0	0
Non-native plant cover	0	35	35.0	3	70	70.0	0	68	68.0	0	57.7	1	0	5	5.0	5	5	5	0	60	60.0	0	60	0
Quality and availability of food and foraging habitat				3.9			4.4			3		3.8				4.1		4.1				0.7		0.7
Quality and availability of shelter				5			6.6			5.1		5.6				3.8		3.8				0		0
Site Condition Score				65.4			59			61.1		62				55.4		55.4				24.7		24.7
MAX Site Condition Score				*100*			*100*			*100*		*100*				*100*		*100*				*100*		*100*
Site Condition Score - out of 3												**1.86**						**1.66**						**0.74**
Site Context																								
Size of patch				10			10			10		10				10		10				10		10
Connectedness				5			5			5		5				5		5				2		2
Context				5			5			5		5				5		5				5		5
Role of site location to species overall population in the state				5			4.1			4.1		4.4				3.3		3.3				0.8		0.8
Threats to the species				9			8.5			8.5		8.7				9		9				6.5		6.5
Species mobility capacity				8			7.3			5.7		7				7.7		7.7				1.3		1.3
Site Context Score				42			39.9			38.3		40.1				40		40				25.6		25.6
MAX Site Context Score				*56*			*56*			*56*		*56*				*56*		*56*				*56*		*56*
Site Context Score - out of 3												**2.15**						**2.14**						**1.37**

Assessment Unit - Regional Ecosystem	AU C1 - RE 12.11.5 Remnant									AU C2 - RE 12.3.11 Remnant						AU S1 - RE 12.3.11 Remnant					
Site Reference	Benchmark	Site 1 (C1 - 1)			Site 2 (C1 - 2)			Average % benchmark	Average Score	Benchmark	Site 1 (C2 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (S1 - 1)			Average % benchmark	Average Score
	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score			12.3.11	Raw Data	% Benchmark	Score			12.3.11	Raw Data	% Benchmark	Score		
Site Condition																					
Recruitment of woody perennial species in EDL	100	50	50.0	3	0	0.0	0	25	1.5	100	66.7	66.7	3	66.7	3	100	0	0.0	0	0	0
Native plant species richness - trees	7	11	157.1	5	12	171.4	5	164.3	5	7	22	314.3	5	314.3	5	7	12	171.4	5	171.4	5
Native plant species richness - shrubs	11	5	45.5	2.5	9	81.8	2.5	63.7	2.5	7	25	357.1	5	357.1	5	7	9	128.6	5	128.6	5
Native plant species richness - grasses	8	9	112.5	5	8	100.0	5	106.3	5	12	3	25.0	2.5	25	2.5	12	2	16.7	0	16.7	0
Native plant species richness - forbes	17	12	70.6	2.5	13	76.5	2.5	73.6	2.5	25	13	52.0	2.5	52	2.5	25	8	32.0	2.5	32	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5	100	5	0			5	97.9	5	0			5	125.3	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4			5	152	4.5	0			4	171.8	4	0			4	186	4
Shrub canopy cover	14	10.5	75.0	5	34	242.9	3	159	4	20	24	120.0	5	120	5	20	16	80.0	5	80	5
Native grass cover	30	19	63.3	3	61	203.3	5	133.3	4	44	30	68.2	3	68.2	3	44	19	43.2	1	43.2	1
Organic litter	50	48	96.0	5	18.4	36.8	3	66.4	4	37	40	108.1	5	108.1	5	37	59	159.5	5	159.5	5
Large trees (euc plus non-euc)	26	6	23.1	5	8	30.8	5	27	5	30	4	13.3	5	13.3	5	30	3	10.0	5	10	5
Coarse woody debris	457	520	113.8	5	720	157.5	5	135.7	5	555	960	173.0	5	173	5	555	60	10.8	2	10.8	2
Non-native plant cover	0	30	30.0	3	1	1.0	10	15.5	6.5	0	22	22.0	5	22	5	0	1	1.0	10	1	10
Quality and availability of food and foraging habitat				4.1			4.6		4.4				3.9		3.9				3.5		3.5
Quality and availability of shelter				5.2			5.1		5.2				8.1		8.1				8.3		8.3
Site Condition Score				62.3			65.7		64.1				67		67				61.3		61.3
MAX Site Condition Score				*100*			*100*		*100*				*100*		*100*				*100*		*100*
Site Condition Score - out of 3									**1.92**						**2.01**						**1.84**
Site Context																					
Size of patch				10			10		10				10		10				2		2
Connectedness				5			5		5				5		5				4		4
Context				4			4		4				4		4				4		4
Role of site location to species overall population in the state				4.1			5		4.6				3.3		3.3				5		5
Threats to the species				6.5			6.5		6.5				8.5		8.5				7		7
Species mobility capacity				6.3			6.3		6.3				5.3		5.3				7		7
Site Context Score				35.9			36.8		36.4				36.1		36.1				29		29
MAX Site Context Score				*56*			*56*		*56*				*56*		*56*				*56*		*56*
Site Context Score - out of 3									**1.95**						**1.93**						**1.55**

Assessment Unit - Regional Ecosystem	AU S2 - RE 12.11.3 Remnant									AU S3 - RE 12.11.3 Regrowth						AU S4 - RE 12.11.5 Remnant										
Site Reference	Benchmark	Site 1 (S2 - 1)			Site 2 (S2 - 2)			Average % benchmark	Average Score	Benchmark	Site 1 (S3 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (S4 - 1)			Site 2 (S4 - 2)			Site 3 (S4 - 3)			Average % benchmark	Average Score
	12.11.3	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score			12.11.3	Raw Data	% Benchmark	Score			12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score		
Site Condition																											
Recruitment of woody perennial species in EDL	100	66.7	66.7	3	50	50.0	3	58.4	3	100	100	100.0	5	100	5	100	100	100.0	5	100	100.0	5	100	100.0	5	100	5
Native plant species richness - trees	6	29	483.3	5	30	500.0	5	491.7	5	6	14	233.3	5	233.3	5	7	20	285.7	5	32	128.0	5	28	400.0	5	271.2	5
Native plant species richness - shrubs	12	30	250.0	5	21	175.0	5	212.5	5	12	8	66.7	2.5	66.7	2.5	11	22	200.0	5	31	134.8	5	20	181.8	5	172.2	5
Native plant species richness - grasses	4	4	100.0	5	7	175.0	5	137.5	5	4	10	250.0	5	250	5	8	2	25.0	2.5	2	200.0	5	7	87.5	2.5	104.2	3.3
Native plant species richness - forbes	21	10	47.6	2.5	10	47.6	2.5	47.6	2.5	21	10	47.6	2.5	47.6	2.5	17	18	105.9	5	13	37.1	2.5	12	70.6	2.5	71.2	3.3
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5	102.5	5	0			5	111	5	0			5			3.3			5	88.6	4.4
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			2.5			4	264.8	3.3	0			4	277.6	4	0			4			3.3			4	189.2	3.8
Shrub canopy cover	21	8	38.1	3	41	195.2	5	116.7	4	21	4	19.0	3	19	3	14	29	207.1	3	20	69.0	5	25	178.6	5	151.6	4.3
Native grass cover	16	39	243.8	5	18	112.5	5	178.2	5	16	20	125.0	5	125	5	30	3	10.0	1	4	26.7	1	9	30.0	1	22.2	1
Organic litter	76	31	40.8	3	62	81.6	5	61.2	4	76	63	82.9	5	82.9	5	50	72	144.0	5	70	129.6	5	65	130.0	5	134.5	5
Large trees (euc plus non-euc)	63	2	3.2	5	6	9.5	5	6.4	5	63	3	4.8	5	4.8	5	26	7	26.9	5	2	2.3	5	4	15.4	5	14.9	5
Coarse woody debris	370	1350	364.9	2	680	183.8	5	274.4	3.5	370	230	62.2	5	62.2	5	457	490	107.2	5	1160	164.5	5	1400	306.3	2	192.7	4
Non-native plant cover	0	9	9.0	5	21	21.0	5	15	5	0	25	25.0	3	25	3	0	35	35.0	3	80	80.0	0	60	60.0	0	58.3	1
Quality and availability of food and foraging habitat				3.2			3.7		3.5				2.6		2.6				4.2			8.3			3.3		5.3
Quality and availability of shelter				6.2			8.6		7.4				6.6		6.6				8.6			6.8			6.4		7.3
Site Condition Score				60.4			71.8		66.2				64.2		64.2				66.3			65.2			56.7		62.7
MAX Site Condition Score				*100*			*100*		*100*				*100*		*100*				*100*			*100*			*100*		*100*
Site Condition Score - out of 3									**1.99**						**1.93**												**1.88**
Site Context																											
Size of patch				10			10		10				10		10				10			10			10		10
Connectedness				4			4		4				2		2				4			4			4		4
Context				4			4		4				5		5				4			4			4		4
Role of site location to species overall population in the state				5			5		5				3.3		3.3				4.1			3.3			3.3		3.6
Threats to the species				8			9		8.5				7.5		7.5				6.5			9			9		8.2
Species mobility capacity				6.3			6.3		6.3				5.3		5.3				6.3			6.3			6		6.2
Site Context Score				37.3			38.3		37.8				33.1		33.1				34.9			36.6			36.3		36
MAX Site Context Score				*56*			*56*		*56*				*56*		*56*				*56*			*56*			*56*		*56*
Site Context Score - out of 3									**2.03**						**1.77**												**1.93**

Assessment Unit - Regional Ecosystem	AU S5 - RE 12.11.5 Regrowth						AU S6 - RE 12.11.10 Remnant						AU S7 - RE 12.11.3 Remnant						Total average % benchmark	Total average score
Site Reference	Benchmark	Site 1 (S5 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (S6 - 1)			Average % benchmark	Average Score	Benchmark	Site 1 (S7 - 1)			Average % benchmark	Average Score		
	12.11.5	Raw Data	% Benchmark	Score			12.11.10	Raw Data	% Benchmark	Score			12.11.3	Raw Data	% Benchmark	Score				
Site Condition																				
Recruitment of woody perennial species in EDL	100	100	100.0	5	100	5	100	94	94.0	5	94	5	100	50	50.0	3	50	3	79.36	4.11
Native plant species richness - trees	7	14	200.0	5	200	5	25	15	60.0	2.5	60	2.5	6	20	333.3	5	333.3	5	185.45	4.71
Native plant species richness - shrubs	11	9	81.8	2.5	81.8	2.5	23	7	30.4	2.5	30.4	2.5	12	24	200.0	5	200	5	123.81	3.63
Native plant species richness - grasses	8	10	125.0	5	125	5	1	1	100.0	5	100	5	4	3	75.0	2.5	75	2.5	104.79	3.97
Native plant species richness - forbes	17	11	64.7	2.5	64.7	2.5	35	8	22.9	0	22.9	0	21	10	47.6	2.5	47.6	2.5	64.33	2.72
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	96.7	5	0			3.3	78	3.3	0			5	89	5	85.31	4.28
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4	243.7	4	0			0	0	0	0			4	280.1	4	154.41	3.17
Shrub canopy cover	14	12	85.7	5	85.7	5	29	0	0.0	0	0	0	21	21	100.0	5	100	5	60.69	3.19
Native grass cover	30	9	30.0	1	30	1	15	2	13.3	1	13.3	1	16	44	275.0	5	275	5	80.65	2.57
Organic litter	50	64	128.0	5	128	5	54	83	153.7	5	153.7	5	76	46	60.5	5	60.5	5	95.65	4.35
Large trees (euc plus non-euc)	26	2	7.7	5	7.7	5	88	30	34.1	5	34.1	5	63	7	11.1	5	11.1	5	12.78	5
Coarse woody debris	457	270	59.1	5	59.1	5	705	13900	1971.6	2	1971.6	2	370	280	75.7	5	75.7	5	216.24	3.29
Non-native plant cover	0	65	65.0	0	65	0	0	0	0.0	10	0	10	0	25	25.0	3	25	3	31.82	3.68
Quality and availability of food and foraging habitat				3.6		3.6				0		0				6.1		6.1		3.64
Quality and availability of shelter				5.2		5.2				4		4				8		8		5.18
Site Condition Score				58.8		58.8				45.3		45.3				69.1		69.1		57.48
MAX Site Condition Score				*100*		*100*				*100*		*100*				*100*		*100*		*100*
Site Condition Score - out of 3						**1.76**						**1.36**						**2.07**		**1.73**
Site Context																				
Size of patch				10		10				10		10				2		2		9.53
Connectedness				4		4				5		5				5		5		3.71
Context				5		5				4		4				4		4		4.65
Role of site location to species overall population in the state				3.3		3.3				0		0				5		5		3.31
Threats to the species				8.5		8.5				8		8				7.5		7.5		8.06
Species mobility capacity				7		7				5.5		5.5				6		6		5.97
Site Context Score				37.8		37.8				32.5		32.5				29.5		29.5		35.23
MAX Site Context Score				*56*		*56*				*56*		*56*				*56*		*56*		*56*
Site Context Score - out of 3						**2.03**						**1.74**						**1.58**		**1.89**

Species Stocking Rate (SSR)						
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score					10
		No	Yes - adjacent		Yes - on site	
Species usage of the site (habitat type & evidenced usage)	Score					15
		Not habitat	Dispersal	Foraging	Breeding	
Approximate density (per ha)	Score		10			
		0%				
Role/importance of species population on site*	Score		5			
	(*Total from*	0	5 - 15	20 - 35	40 - 45	
Total SRR score (out of 70)				40		
SRR Score (out of 4)				**2.29**		

*SSR Supplementary Table			
*Key source population for breeding	Score		10
		No	Yes/ Possibly
*Key source population for dispersal	Score		5
		No	Yes/ Possibly
*Necessary for maintaining genetic diversity	Score	0	
		No	Yes/ Possibly
*Near the limit of the species range	Score	0	
		No	Yes

Final habitat quality score (weighted)	AU N1	AU N2	AU N3	AU N4	AU N5	AU N6	AU N7	AU N8	AU N9	AU C1	AU C2	AU S1	AU S2	AU S3	AU S4	AU S5	AU S6	AU S7	Final (Average)
Site Condition score (out of 3)	1.10	1.70	1.64	1.97	2.13	1.84	1.86	1.66	0.74	1.92	2.01	1.84	1.99	1.93	1.88	1.76	1.36	2.07	1.73
Site Context Score (out of 3)	1.53	2.01	2.03	1.90	1.99	2.03	2.15	2.14	1.37	1.95	1.93	1.55	2.03	1.77	1.93	2.03	1.74	1.58	1.89
Species Stocking Rate Score (out of 4)	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29	2.29
Habitat Quality score (out of 10)	*4.92*	*6.00*	*5.96*	*6.16*	*6.41*	*6.16*	*6.30*	*6.09*	*4.40*	*6.16*	*6.23*	*5.68*	*6.31*	*5.99*	*6.10*	*6.08*	*5.39*	*5.94*	*5.90*
Assessment Unit area (ha)	6.93	10.06	15.46	22.29	3.55	33.19	91.72	5.14	2.24	41.27	8	0.66	14.21	3.88	20.82	4.96	1.69	1.16	16.83
Total offset area (ha) for this MNES	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23	287.23
Size Weighting	0.02	0.04	0.05	0.08	0.01	0.12	0.32	0.02	0.01	0.14	0.03	0.00	0.05	0.01	0.07	0.02	0.01	0.00	1
Weighted Habitat Quality Score	***0.12***	***0.21***	***0.32***	***0.48***	***0.08***	***0.71***	***2.01***	***0.11***	***0.03***	***0.89***	***0.17***	***0.01***	***0.31***	***0.08***	***0.44***	***0.10***	***0.03***	***0.02***	***6.12***

Appendix B

Modified QLD Habitat Quality Sheet for Black-breasted button-quail

OFFSET - Fauna Species Black-breasted button-quail

Assessment Unit - Regional Ecosystem	AU S1 - RE 12.3.11 Remnant						AU S2 - RE 12.11.3 Remnant								
Site Reference	Benchmark	Site 1			Average % benchmark	Average Score	Benchmark	Site 1			Site 2			Average % benchmark	Average Score
	12.3.11	Raw Data	% Benchmark	Score			12.11.3	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score		
Site Condition															
Recruitment of woody perennial species in EDL	100	0	0.0	0	0	0	100	66.7	66.7	3	50	50.0	3	58.4	3
Native plant species richness - trees	7	12	171.4	5	171.4	5	6	29	483.3	5	30	500.0	5	491.7	5
Native plant species richness - shrubs	7	9	128.6	5	128.6	5	12	30	250.0	5	21	175.0	5	212.5	5
Native plant species richness - grasses	12	2	16.7	0	16.7	0	4	4	100.0	5	7	175.0	5	137.5	5
Native plant species richness - forbes	25	8	32.0	2.5	32	2.5	21	10	47.6	2.5	10	47.6	2.5	47.6	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	125.3	5	0			5			5	102.5	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4	186	4	0			2.5			4	264.8	3.3
Shrub canopy cover	20	16	80.0	5	80	5	21	8	38.1	3	41	195.2	5	116.7	4
Native grass cover	44	19	43.2	1	43.2	1	16	39	243.8	5	18	112.5	5	178.2	5
Organic litter	37	59	159.5	5	159.5	5	76	31	40.8	3	62	81.6	5	61.2	4
Large trees (euc plus non-euc)	30	3	10.0	5	10	5	63	2	3.2	5	6	9.5	5	6.4	5
Coarse woody debris	555	60	10.8	2	10.8	2	370	1350	364.9	2	680	183.8	5	274.4	3.5
Non-native plant cover	0	1	1.0	10	1	10	0	9	9.0	5	21	21.0	5	15	5
Quality and availability of food and foraging habitat				2		2				2.5			6.3		4.4
Quality and availability of shelter				4.9		4.9				5.8			6.4		6.1
Site Condition Score				56.4		56.4				59.3			72.2		65.8
MAX Site Condition Score				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3						**1.69**									**1.97**
Site Context															
Size of patch				2		2				10			10		10
Connectedness				4		4				5			5		5
Context				4		4				4			4		4
Role of site location to species overall population in the state				3		3				7			7		7
Threats to the species				3		3				3			2		2.5
Species mobility capacity				4		4				5			5		5
Site Context Score				20		20				34			33		33.5
MAX Site Context Score				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3						**1.07**									**1.79**

Assessment Unit - Regional Ecosystem	AU S4 - RE 12.11.5 Remnant												AU S6 - RE 12.11.10 Remnant						Total	Total
Site Reference	Benchmark	Site 1			Site 2			Site 3			Average %		Benchmark	Site 1			Average %	Average	average %	average
	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Average Score	12.11.10	Raw Data	% Benchmark	Score	benchmark	Score	benchmark	score
Site Condition																				
Recruitment of woody perennial species in EDL	100	100	100.0	5	100	100.0	5	100	100.0	5	100	5	100	94	94.0	5	94	5	52.8	2.67
Native plant species richness - trees	7	20	285.7	5	32	128.0	5	28	400.0	5	271.2	5	25	15	60.0	2.5	60	2.5	311.43	5
Native plant species richness - shrubs	11	22	200.0	5	31	134.8	5	20	181.8	5	172.2	5	23	7	30.4	2.5	30.4	2.5	171.1	5
Native plant species richness - grasses	8	2	25.0	2.5	2	200.0	5	7	87.5	2.5	104.2	3.3	1	1	100.0	5	100	5	86.13	2.77
Native plant species richness - forbes	17	18	105.9	5	13	37.1	2.5	12	70.6	2.5	71.2	3.3	35	8	22.9	0	22.9	0	50.27	2.77
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			3.3			5	88.6	4.4	0			3.3	78	3.3	105.47	4.8
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4			3.3			4	189.2	3.8	0			3.3	95.2	3.3	213.33	3.7
Shrub canopy cover	14	29	207.1	3	20	69.0	5	25	178.6	5	151.6	4.3	29	8	27.6	3	27.6	3	116.1	4.43
Native grass cover	30	3	10.0	1	4	26.7	1	9	30.0	1	22.2	1	15	2	13.3	1	13.3	1	81.2	2.33
Organic litter	50	72	144.0	5	70	129.6	5	65	130.0	5	134.5	5	54	83	153.7	5	153.7	5	118.4	4.67
Large trees (euc plus non-euc)	26	7	26.9	5	2	2.3	5	4	15.4	5	14.9	5	88	30	34.1	5	34.1	5	10.43	5
Coarse woody debris	457	490	107.2	5	1160	164.5	5	1400	306.3	2	192.7	4	705	13900	1971.6	2	1971.6	2	159.3	3.17
Non-native plant cover	0	35	35.0	3	80	80.0	0	60	60.0	0	58.3	1	0	0	0.0	10	0	10	24.77	5.33
Quality and availability of food and foraging habitat				4.5			5.8			4		4.8				3		3		3.73
Quality and availability of shelter				6.1			4.8			4.1		5				3.9		3.9		5.33
Site Condition Score				64.1			60.7			55.1		59.9				54.5		54.5		60.7
MAX Site Condition Score				*100*			*100*			*100*		*100*				*100*		*100*		*100*
Site Condition Score - out of 3												**1.80**						**1.64**		**1.82**
Site Context																				
Size of patch				10			10			10		10				10		10		7.33
Connectedness				4			4			4		4				5		5		4.33
Context				4			4			4		4				4		4		4
Role of site location to species overall population in the state				7			7			7		7				3		3		5.67
Threats to the species				3			6			6		5				4		4		3.5
Species mobility capacity				6			4			5		5				4		4		4.67
Site Context Score				34			35			36		35				30		30		29.5
MAX Site Context Score				*56*			*56*			*56*		*56*				*56*		*56*		*56*
Site Context Score - out of 3												**1.88**						**1.61**		**1.58**

Species Stocking Rate (SSR)								
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score							10
		No		Yes - adjacent			Yes - on site	
Species usage of the site (habitat type & evidenced usage)	Score							15
		Not habitat		Dispersal		Foraging	Breeding	
Approximate density (per ha)	Score					20		
		0%						
Role/importance of species population on site*	Score (*Total from*					10		
		0		5 - 15		20 - 35		40 - 45
Total SRR score (out of 70)				55				
SRR Score (out of 4)				**3.14**				

*SSR Supplementary Table			
*Key source population for breeding	Score		10
		No	Yes/ Possibly
*Key source population for dispersal	Score		5
		No	Yes/ Possibly
*Necessary for maintaining genetic diversity	Score		15
		No	Yes/ Possibly
*Near the limit of the species range	Score	0	
		No	Yes

Final habitat quality score (weighted)	AU S1	AU S2	AU S4	AU S6	Final (Average)
Site Condition score (out of 3)	1.69	1.97	1.80	1.64	1.82
Site Context Score (out of 3)	1.07	1.79	1.88	1.61	1.58
Species Stocking Rate Score (out of 4)	3.14	3.14	3.14	3.14	3.14
Habitat Quality score (out of 10)	*5.90*	*6.90*	*6.82*	*6.39*	*6.54*
Assessment Unit area (ha)	0.66	11.28	14.79	5.92	8.91
Total offset area (ha) for this MNES	32.65	32.65	32.65	32.65	32.65
Size Weighting	0.02	0.35	0.45	0.18	
Weighted Habitat Quality Score	***0.12***	***2.38***	***3.09***	***1.16***	***6.75***

Appendix C

BioCondition Field Data

Site: N1 - 1	**Date**: 30/03/22 10:30AM	**Recorder**: Peter Moonie
Locality/Land parcel: 3MPH23906		**UIN**: 201008093312
GTRE: HVR 12.3.11 - Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 4 **Sub-canopy:** None		

EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 5	**Percentage recruiting:** 100

Number of large trees (100x50 m): 0	
Large eucalypt benchmark (DBH) value: 49	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 0	**Number of large non-eucalypt:** 0
Native tree species richness (100x50 m) 10	
Acacia disparrima subsp. disparrima, Angophora floribunda (rough-barked apple), Lophostemon confertus (brush box), Acacia leiocalyx, Eucalyptus tereticornis, Lophostemon suaveolens (swamp box), Melaleuca salicina, Acacia maidenii (Maiden's wattle), Glochidion ferdinandi, Polyscias elegans	
Native shrub species richness (50x10 m) 3	
Acacia disparrima subsp. disparrima, Eucalyptus tereticornis, Dodonaea viscosa	
Native grass species richness (50x10 m) 4	
Imperata cylindrica (blady grass), Bothriochloa bladhii, Panicum sp., Enneapogon sp.	
Native forbs/others species richness (50x10 m) 12	
Centella asiatica, Dichondra repens (kidney weed), Dianella caerulea, Polymeria calycina (pink bindweed), Cyperus polystachyos, Fimbristylis dichotoma, Fuirena ciliaris, Cyperus sp. 2, Marsdenia sp., Lobelia purpurascens, Commelina sp., Juncus sp.	
Non-native plant cover (50x10 m): 20	
Coarse woody debris (50x20 m): 0	
Coarse woody debris lengths (m): 0	
Quadrat 1	
Native perennial grass cover: 30	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 2	
Native perennial grass cover: 20	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 5	**Organic litter cover:** 20
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	

Native perennial grass cover: 10	**Organic litter cover:** 70
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 10
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South West	**Transect length:** 100m
Canopy: 19 m	
Sub-canopy: None m	
Shrub: 0.5 m	
Photos	
Point: 152.63384974758807, -26.06598916103591	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Note: None

Site: N2 – 1	**Date**: 29/03/22 3:45PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 878MCH1061		**UIN**: 201008130959	
GTRE: 12.3.11 - Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 24 **Sub-canopy:** 11			
EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 100
Number of large trees (100x50 m): 1			
Large eucalypt benchmark (DBH) value: 49		**Large non-eucalypt benchmark (DBH) value:** 36	
Number of large eucalypt: 1		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 18			
Lophostemon suaveolens (swamp box), Acacia disparrima subsp. disparrima, Acacia fimbriata (Brisbane golden wattle), Acacia maidenii (Maiden's wattle), Melaleuca salicina, Polyscias elegans (celery wood), Angophora floribunda (rough-barked apple), Cryptocarya triplinervis, Lophostemon confertus (brush box), Cupaniopsis parvifolia (small-leaved tuckeroo), Eucalyptus propinqua, Glochidion ferdinandi, Mallotus philippensis, Trema tomentosa, Flindersia schottiana, Myrsine variabilis, Alstonia constricta, Cupaniopsis anacardioides			
Native shrub species richness (50x10 m) 13			
Melaleuca salicina, Acacia maidenii (Maiden's wattle), Acacia fimbriata (Brisbane golden wattle), Glochidion ferdinandi, Maclura cochinchinensis, Ficus coronata, Wikstroemia indica, Neolitsea dealbata, Breynia oblongifolia, Lophostemon confertus, Melia azedarach, Rhodosphaera rhodanthema, Cryptocarya triplinervis,			
Native grass species richness (50x10 m) 3			
Ottochloa gracillima (pademelon grass), Oplismenus aemulus, Imperata cylindrica			
Native forbs/others species richness (50x10 m) 8			
Eustrephus latifolius (wombat berry), Dianella caerulea, Pteridium esculentum (common bracken), ? Doodia caudata, Stephania japonica, Lomandra hystrix, Flemingia parviflora, Geitonoplesium cymosum,			
Non-native plant cover (50x10 m): 50			
Coarse woody debris (50x20 m): 12			
Coarse woody debris lengths (m): 12			
Quadrat 1			
Native perennial grass cover: 95		**Organic litter cover:** 5	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 50		**Organic litter cover:** 20	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 20		**Organic litter cover:** 50	
Native other grass: None		Native forbs: None	

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 90	**Organic litter cover:** 10
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 100	**Organic litter cover:** 0
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 55 m	
Sub-canopy: 76 m	
Shrub: 5 m	
Photos	
Point: 152.62838810554535, -26.06946420504439	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N3 – 1	**Date**: 29/02/22 8:15AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 878MCH1061		**UIN**: 201007112113	
GTRE: 12.9-10.17b - Corymbia citriodora subsp. variegata mixed open forest to woodland. Other commonly occurring canopy trees include Eucalyptus acmenoides, Angophora leiocarpa, E. siderophloia, E. carnea, E. longirostrata and C. intermedia.			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 24 **Sub-canopy:** 8			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 100
Number of large trees (100x50 m): 6			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 6		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 10			
Eucalyptus racemosa subsp. racemosa (scribbly gum), Corymbia intermedia (pink bloodwood), Angophora leiocarpa (rusty gum), Eucalyptus acmenoides, Lophostemon confertus (brush box), Eucalyptus propinqua (small-fruited grey gum), Allocasuarina sp., Trema tomentosa, Brachychiton sp., Banksia integrifolia			
Native shrub species richness (50x10 m) 6			
Acacia disparrima subsp. disparrima, Lophostemon confertus (brush box), Cupaniopsis parvifolia (small-leaved tuckeroo), Eucalyptus sp1 (seedling), Acacia leiocalyx, Petalostigma pubescens,			
Native grass species richness (50x10 m) 6			
Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Digitaria sp., Eragrostis sp., Oplismenus aemulus, Panicum sp.			
Native forbs/others species richness (50x10 m) 15			
Eustrephus latifolius (wombat berry), Lomandra longifolia, Desmodium rhytidophyllum, Lomandra multiflora, Cyperus sp. 2, Goodenia rotundifolia, Abildgaardia sp., Cyperus sp., Commelina cyanea, Cayratia clematidea, Lepidosperma laterale, Trachymene sp., Stephania japonica, Coleus sp., Glycine sp.			
Non-native plant cover (50x10 m): 50			
Coarse woody debris (50x20 m): 55			
Coarse woody debris lengths (m): 55			
Quadrat 1			
Native perennial grass cover: 40		**Organic litter cover:** 5	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 20		**Organic litter cover:** 0	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 10		**Organic litter cover:** 10	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	

Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 5	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 40
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South West	**Transect length:** 100m
Canopy: 49 m	
Sub-canopy: 3 m	
Shrub: 10 m	
Photos	
Point: 152.62172222826018, -26.070715336775695	
Photo North: 	
Photo East: 	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: Fire impacts from 2020

Site: N3 - 2	**Date**: 30/03/22 11:35AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 1MPH23906		**UIN**: 201008153033	
GTRE: 12.9-10.4 - Eucalyptus racemosa subsp. racemosa woodland on sedimentary rocks. Note: DNRME mapped as 12.9-10.17b. RE at location of plot is a mix of both.			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 21 **Sub-canopy:** 10			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 60
Number of large trees (100x50 m): 8			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 8		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 14			
Eucalyptus siderophloia, Acacia disparrima subsp. disparrima, Eucalyptus propinqua (small-fruited grey gum), Corymbia intermedia (pink bloodwood), Alphitonia excelsa (soap tree), Eucalyptus acmenoides, Alstonia constricta (bitterbark), Acacia maidenii (Maiden's wattle), Allocasuarina, Angophora leiocarpa (rusty gum), Lophostemon suaveolens (swamp box), Acacia leiocalyx, Eucalyptus racemosa subsp. racemosa (scribbly gum), Cupaniopsis parviflora			
Native shrub species richness (50x10 m) 7			
Eucalyptus sp.1 (seedling), Alphitonia excelsa (soap tree), Alstonia constricta (bitterbark), Eucalyptus sp.2 (seedling), Acacia maidenii (Maiden's wattle), Cupaniopsis parviflora, Acacia leiocalyx			
Native grass species richness (50x10 m) 9			
Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Ottochloa gracillima (pademelon grass), Aristida sp.1 , Oplismenus aemulus, Cymbopogon refractus, Panicum diffusum, Paspalidium sp., Digitaria parviflora			
Native forbs/others species richness (50x10 m) 15			
Lomandra multiflora, Lomandra confertifolia subsp. pallida, Eustrephus latifolius (wombat berry), Desmodium rhytidophyllum , Lomandra longifolia, Lobelia purparensis, Flemingia parviflora, Glycine sp., Stephania japonica, Scleria sp., Carex inversa, Platycerium sp., Commelina sp., Cyanthillium cinerea, Sigesbeckia orientalis			
Non-native plant cover (50x10 m): 70			
Coarse woody debris (50x20 m): 100			
Coarse woody debris lengths (m): 100			
Quadrat 1			
Native perennial grass cover: 2		**Organic litter cover:** 95	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 0		**Organic litter cover:** 60	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 10		**Organic litter cover:** 60	

Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 0	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 20
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South West	**Transect length:** 100m
Canopy: 44 m	
Sub-canopy: 35 m	
Shrub: 15 m	
Photos	
Point: 152.6285091525296, -26.07377064930418	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N4 - 1	**Date**: 28/03/22 10:00AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 889CP864404		**UIN**: 201006083637	
GTRE: 12.9-10.17b			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 29 **Sub-canopy:** 12			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 100
Number of large trees (100x50 m): 11			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 11		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 10			
Eucalyptus tereticornis, Corymbia citriodora (spotted gum), Eucalyptus siderophloia, Eucalyptus exserta (Queensland peppermint), Corymbia tessellaris (Moreton Bay ash), Corymbia intermedia (pink bloodwood), Acacia disparrima subsp. disparrima, Eucalyptus propinqua (small-fruited grey gum), Lophostemon suaveolens (swamp box), Lophostemon confertus			
Native shrub species richness (50x10 m) 6			
Acacia disparrima subsp. disparrima, Eucalyptus siderophloia, Alphitonia excelsa (soap tree), Acacia leiocalyx, Corymbia intermedia (pink bloodwood), Corymbia citriodora (spotted gum)			
Native grass species richness (50x10 m) 8			
Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Heteropogon contortus, Panicum effusum, Eragrostis brached , Digitaria parviflora, Alloteropsis semialata, Imperata cylindrica			
Native forbs/others species richness (50x10 m) 18			
Sphaeromorphaea australis, Cyperus gracilis, Cyanthillium cinereum, Cheilanthes distans (bristly cloak fern), Lobelia purpurascens (white root), Goodenia rotundifolia, Dianella caerulea, Ghania aspera, Cheilanthes sieberiana, Murdannia graminea, Desmodium rhytidophyllum, Cyperus sp. 1, Scleria sp., Cyperus sp. 2, Hypoxis sp., Oldenlandia sp., Wahlenbergia sp., Fimbristylis dichotoma			
Non-native plant cover (50x10 m): 25			
Coarse woody debris (50x20 m): 14			
Coarse woody debris lengths (m): 14			
Quadrat 1			
Native perennial grass cover: 30		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 5		**Organic litter cover:** 15	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 60		**Organic litter cover:** 20	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	

Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 60	**Organic litter cover:** 5
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 90	**Organic litter cover:** 5
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: West	**Transect length:** 100m
Canopy: 27.9 m	
Sub-canopy: 24.7 m	
Shrub: 9 m	
Photos	
Point: 152.60420494312442, -26.05994206412189	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: None

Site: N4 - 2	**Date**: 29/03/22 12:00PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 889CP864404		**UIN**: 201006155952	
GTRE: 12.9-10.17b - Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata open forest on sedimentary rocks			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 23 **Sub-canopy:** 12			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 75
Number of large trees (100x50 m): 5			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 5		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 13			
Lophostemon confertus (brush box), Eucalyptus propinqua (small-fruited grey gum), Corymbia intermedia (pink bloodwood), Angophora leiocarpa (rusty gum), Eucalyptus acmenoides, Eucalyptus siderophloia, Acacia disparrima subsp. disparrima, Jagera pseudorhus var. pseudorhus, Alphitonia excelsa (soap tree), Lophostemon suaveolens (swamp box), Cyclophyllum coprosmoides, ,Allocasuarina ?littoralis, Elaeodendron australe			
Native shrub species richness (50x10 m) 8			
Lophostemon suaveolens (swamp box), Lophostemon confertus (brush box), Alphitonia excelsa (soap tree), Glochidion ferdinandi, Acacia disparrima subsp. disparrima , Acacia maidenii, Eucalyptus sp. 1, Euclayptus sp. 2			
Native grass species richness (50x10 m) 9			
Imperata cylindrica (blady grass), Entolasia stricta (wiry panic), Cymbopogon refractus (barbed-wire grass), Themeda triandra, Eriachne sp., Oplismenus aemulus, Ottochloa gracilis, Paspalidium sp., Digitaria parviflora			
Native forbs/others species richness (50x10 m) 14			
Lomandra confertifolia subsp. pallida, Laxmannia gracilis (slender wire lily), Dianella caerulea, Lobelia purpurascens (white root), Geitonoplesium cymosum (scrambling lily), Abildgaardia ovata, Desmodium rhytidophyllum , Lomandra filifolia, Cheilanthes sieberiana , Cyanthillium cinerea, Passiflora aurantia, Cymbopogon refractus, Glycine sp., Pimelea linifolia			
Non-native plant cover (50x10 m): 48			
Coarse woody debris (50x20 m): 60			
Coarse woody debris lengths (m): 60			
Quadrat 1			
Native perennial grass cover: 0		**Organic litter cover:** 80	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 5		**Organic litter cover:** 60	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 10		**Organic litter cover:** 80	

Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 10	**Organic litter cover:** 80
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 90
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: West	**Transect length:** 100m
Canopy: 47.5 m	
Sub-canopy: 52 m	
Shrub: 6 m	
Photos	
Point: 152.61074424324508, -26.06417295627528	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: excluded trees <7m in sub-canopy cover calculations.

Site: N5 - 1	**Date**: 28/03/22 11:50AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 889CP864404		**UIN**: 201006111047	
GTRE: HVR 12.9-10.17b - Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata open fores on sedimentary rocks			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 24 **Sub-canopy:** 10			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 100
Number of large trees (100x50 m): None			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 4 (5)		**Number of large non-eucalypt:** None	
Native tree species richness (100x50 m) 10			
Acacia disparrima subsp. disparrima, Lophostemon suaveolens (swamp box), Eucalyptus exserta (Queensland peppermint), Eucalyptus tereticornis, Corymbia citriodora (spotted gum), Corymbia intermedia (pink bloodwood), Eucalyptus siderophloia, Alphitonia excelsa (soap tree), Corymbia tessellaris (Moreton Bay ash), Acacia leiocalyx,			
Native shrub species richness (50x10 m) 10			
Acacia disparrima subsp. disparrima, Eucalyptus sp 1 (narrow leaf), Cyclophyllum coprosmoides, Acacia leiocalyx, Sp. alternate lime, Alphitonia excelsa (soap tree), Corymbia citriodora (spotted gum), Solanum ellipticum, Breynia oblongifolia, Lophostemon suaveolens			
Native grass species richness (50x10 m) 12			
Panicum effusum, Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Eragrostis brached, Imperata cylindrica (blady grass), Paspalidium sp., Digitaria parviflora, Themeda triandra, Aristida sp., Alloteropsis semialata, Oplismenus aemulus, Chrysopogon fallax			
Native forbs/others species richness (50x10 m) 24			
Dianella caerulea, Lomandra confertifolia subsp. pallida, Dianella revoluta var. revoluta, Cheilanthes distans (bristly cloak fern), Goodenia rotundifolia, Cyanthillium cinereum, Gahnia aspera, Lobelia purpurascens (white root), Lomandra multiflora , Glossocardia bidens, Pigea stellarioides, Cyperus sp. 1, Fimbristylis dichotoma , Murdannia graminea, Hypoxis sp., Cyperus sp. 2, Desmodium rhytidophyllum, Laxmannia gracilis, Oldenlandia sp., Sphaeromorphaea australis, hastate vine, Glycine sp. , Commelina sp., Phyllanthus sp.			
Non-native plant cover (50x10 m): 20			
Coarse woody debris (50x20 m): 57			
Coarse woody debris lengths (m): 57			
Quadrat 1			
Native perennial grass cover: 20		**Organic litter cover:** 70	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 95		**Organic litter cover:** 5	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			

Native perennial grass cover: 18	**Organic litter cover:** 80
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 40	**Organic litter cover:** 10
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 75	**Organic litter cover:** 10
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North	**Transect length:** 100m
Canopy: 25.4 m	
Sub-canopy: 57 m	
Shrub: 11 m	
Photos	
Point: 152.603681009583, -26.05918988202735	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N6 - 1a	**Date**: 29/03/22 10:30AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 878MCH1061		**UIN**: 201118124819	
GTRE: 12.9-10.17b/12.9-10.4. 12.9-10.17b - Eucalyptus acmenoides, E. major, E. siderophloia +/- Corymbia citriodora subsp. variegata open forest on sedimentary rocks. 12.9-10.4 - Eucalyptus racemosa subsp. racemosa woodland on sedimentary rocks			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 20 **Sub-canopy:** 9			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 80
Number of large trees (100x50 m): 6			
Large eucalypt benchmark (DBH) value: 46		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 6		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 13			
Corymbia intermedia (pink bloodwood), Eucalyptus acmenoides, Eucalyptus propinqua (small-fruited grey gum), Angophora leiocarpa (rusty gum), Alphitonia excelsa (soap tree), Acacia disparrima subsp. disparrima, Acacia leiocalyx, Lophostemon confertus (brush box), Corymbia citriodora (spotted gum), Brachychiton populneus, Jacksonia scoparia, Allocasuarina littoralis, Jagera pseudorhus			
Native shrub species richness (50x10 m) 6			
Alphitonia excelsa (soap tree), Eucalyptus sp. 1(seedling), Acacia disparrima, Corymbia citriodora (spotted gum), Xanthorrhoea latifolia, Eucalyptus acmenoides			
Native grass species richness (50x10 m) 9			
Panicum effusum, Imperata cylindrica (blady grass), Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Eriachne sp., Digitaria parviflora, Aristida sp., Heteropogon contortus, Ottochloa gracillima			
Native forbs/others species richness (50x10 m) 14			
Dianella brevipedunculata, Lomandra longifolia, Lomandra multiflora, Glycine clandestina var. clandestina, Eustrephus latifolius (wombat berry), Brunoniella australis, Desmodium rhytidophyllum, Gahnia aspera, Abildgaardia ovata, Scleria sp., Cheilanthes distans, Passiflora aurantia, Lobelia purpurascens, Cyperus sp. 1			
Non-native plant cover (50x10 m): 35			
Coarse woody debris (50x20 m): 117			
Coarse woody debris lengths (m): 117			
Quadrat 1			
Native perennial grass cover: 0		**Organic litter cover:** 50	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 0		**Organic litter cover:** 70	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 5		**Organic litter cover:** 10	

Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 20	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 60
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 53.5 m	
Sub-canopy: 42 m	
Shrub: 8 m	
Photos	
Point: 152.6216846189632, -26.068683420836734	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect End:

Note: None

Site: N6 - 2	**Date**: 28/03/2022 4:15PM	**Recorder**: Peter Moonie
Locality/Land parcel: 878MCH1061		**UIN**: 201007141000

GTRE: 12.9-10.17b/12.9-10.4. 12.9-10.17b - Corymbia citriodora subsp. variegata mixed open forest to woodland. Other commonly occurring canopy trees include Eucalyptus acmenoides, Angophora leiocarpa, E. siderophloia, E. carnea, E. longirostrata and C. intermedia. 12.9-10.4- Eucalyptus racemosa subsp. racemosa woodland on sedimentary rocks

Median tree canopy heights (m):
Emergent: None **Canopy:** 22 **Sub-canopy:** 10

EDL:	**No. of dominant species in the EDL**: 5 (6)	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 80

Number of large trees (100x50 m): 6

Large eucalypt benchmark (DBH) value: 46	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 7	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 15

Corymbia intermedia (pink bloodwood), Eucalyptus racemosa subsp. racemosa (scribbly gum), Acacia disparrima subsp. disparrima, Angophora leiocarpa (rusty gum), Lophostemon suaveolens (swamp box), Alphitonia excelsa (soap tree), Eucalyptus acmenoides, Eucalyptus propinqua (small-fruited grey gum), Lophostemon confertus (brush box), Elaeodendron australe, Petalostigma pubescens (quinine tree), Banksia integrifolia, Acacia maidenii (Maiden's wattle), Glochidion ferdinandi, Jagera pseudorhus,

Native shrub species richness (50x10 m) 8

Angophora leiocarpa (rusty gum), Acacia disparrima, Xanthorrhoea johnsonii, Eucalyptus sp 1, Pimelia linifolia, Acacia leiocalyx, Leucopogon juniperinus (prickly heath), Acacia maidenii (Maiden's wattle),

Native grass species richness (50x10 m) 9

Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Eriachne sp., Cymbopogon refractus (barbed-wire grass), Oplismenus aemulus (creeping shade grass), Paspalidium distans, Eragrostis sp., Digitaria parviflora, Panicum sp.

Native forbs/others species richness (50x10 m) 10

Lomandra longifolia, Lomandra multiflora, Laxmannia gracilis (slender wire lily), Dianella revoluta var. revoluta, Dianella caerulea, Eustrephus latifolius (wombat berry), Dianella brevipedunculata, Lobelia purpurascens, Abildgaardia ovata, Flemingia parviflora

Non-native plant cover (50x10 m): 25

Coarse woody debris (50x20 m): 24

Coarse woody debris lengths (m): 24

Quadrat 1

Native perennial grass cover: 5	**Organic litter cover:** 90
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 2

Native perennial grass cover: 5	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None	
Quadrat 3	
Native perennial grass cover: 0	**Organic litter cover:** 80
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 0	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 50
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North West	**Transect length:** 100m
Canopy: 56 m	
Sub-canopy: 69 m	
Shrub: 5 m	
Photos	
Point: 152.62400063908188, -26.070217738061817	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 1	**Date**: 30/03/22 7:40AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 878MCH1061		**UIN**: 201007092108	
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 21 **Sub-canopy:** 7			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 80
Number of large trees (100x50 m): 2			
Large eucalypt benchmark (DBH) value: 43		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 2		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 10			
Eucalyptus acmenoides, Eucalyptus siderophloia, Lophostemon confertus (brush box), Corymbia citriodora (spotted gum), Acacia fimbriata (Brisbane golden wattle), Eucalyptus propinqua (small-fruited grey gum), Acacia disparrima subsp. disparrima, Acacia penninervis var. penninervis, Acacia leiocalyx, Alphitonia excelsa (soap tree)			
Native shrub species richness (50x10 m) 10			
Acacia leiocalyx, Acacia fimbriata (Brisbane golden wattle), Lophostemon confertus (brush box), Acacia disparrima subsp. disparrima, Leucopogon juniperinus (prickly heath), Alphitonia excelsa (soap tree), Jacksonia scoparia, Myoporum acuminatum, Eucalyptus sp. 1, Eucalyptus sp. 2			
Native grass species richness (50x10 m) 9			
Imperata cylindrica (blady grass), Oplismenus aemulus (creeping shade grass), Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Aristida sp., Panicum effusum, Paspalidium distans, Themeda triandra, Digitaria parviflora			
Native forbs/others species richness (50x10 m) 20			
Desmodium rhytidophyllum, Dianella caerulea, Cyanthillium cinereum, Glycine sp, Lomandra confertifolia subsp. pallida, Lepidosperma laterale, Dianella revoluta var. revoluta, Parsonsia straminea (monkey rope), Goodenia rotundifolia, Eustrephus latifolius (wombat berry), Secamone elliptica, Coleus sp., Brunoniella australis, Cyperus sp., fern, Passiflora aurantia, Pigea stellarioides, Hardenbergia violacea, Eremophila debilis			
Non-native plant cover (50x10 m): 35			
Coarse woody debris (50x20 m): 75			
Coarse woody debris lengths (m): 75			
Quadrat 1			
Native perennial grass cover: 0		**Organic litter cover:** 80	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 0		**Organic litter cover:** 50	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			

Native perennial grass cover: 10	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 5	**Organic litter cover:** 90
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 80
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: West	**Transect length:** 100m
Notes: 12.11.5e; did not include T3 2-6m in subcanopy	
Canopy: 24 m	
Sub-canopy: 59.5 m	
Shrub: 17 m	
Photos	
Point: 152.6219363694197, -26.059450867144868	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 2a	**Date**: 29/03/2022 2:25PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 878MCH1061		**UIN**: 201118150034	
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 18 **Sub-canopy:** 8			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 60
Number of large trees (100x50 m): 4			
Large eucalypt benchmark (DBH) value: 43		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 4		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 14			
Corymbia citriodora (spotted gum), Eucalyptus acmenoides, Lophostemon confertus (brush box), Acacia disparrima, Polyscias elegans (celery wood), Eucalyptus propinqua (small-fruited grey gum), Eucalyptus siderophloia, Eucalyptus exserta (Queensland peppermint), Angophora leiocarpa (rusty gum), Acacia leiocalyx, Corymbia intermedia (pink bloodwood), Melaleuca salicina			
Native shrub species richness (50x10 m) 9			
Lophostemon confertus (brush box), Acacia disparrima, Acacia maidenii (Maiden's wattle), Pandorea pandorana (wonga vine), Leucopogon juniperinus (prickly heath), Alphitonia excelsa (soap tree), Elaeodendron australe, Wikstroemia indica, Alstonia constricta,			
Native grass species richness (50x10 m) 6			
Oplismenus aemulus (creeping shade grass), Ottochloa gracillima (pademelon grass), Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Cymbopogon refractus (barbed-wire grass), Themeda triandra (kangaroo grass)			
Native forbs/others species richness (50x10 m) 23			
Eustrephus latifolius (wombat berry), Lobelia purpurascens (white root), Cheilanthes sieberi, Desmodium rhytidophyllum, Lomandra multiflora, Cyperus indet, Eremophila debilis (winter apple), Sigesbeckia orientalis (Indian weed), Glycine clandestina, Passiflora aurantia, Dianella caerulea, Eustrephus latifolius (wombat berry), Lomandra filiformis, Doodia caudata, Ajuga australis (Australian bugle), Hardenbergia violacea , Viola hederacea, Brunoniella australis, Hardenbergia violacea, Commelina diffusa, Coleus sp., Desmodium gunnii, fern sp.2			
Non-native plant cover (50x10 m): 70			
Coarse woody debris (50x20 m): 52			
Coarse woody debris lengths (m): 52			
Quadrat 1			
Native perennial grass cover: 5		**Organic litter cover:** 85	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 15		**Organic litter cover:** 10	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			

Quadrat 3	
Native perennial grass cover: 5	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 2	**Organic litter cover:** 70
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 2	**Organic litter cover:** 90
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South West	**Transect length:** 100m
Notes: Did not include trees under 7 m in the sub canopy	
Canopy: 32.5 m	
Sub-canopy: 82 m	
Shrub: 18 m	
Photos	
Point: 152.6273964984509, -26.069369961579913	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 3	**Date**: 30/03/22 2:00PM	**Recorder**: Peter Moonie
Locality/Land parcel: 3MPH23906		**UIN**: 201008071031

GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics

Median tree canopy heights (m):
Emergent: None **Canopy:** 19 **Sub-canopy:** 10

EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 75

Number of large trees (100x50 m): 2

Large eucalypt benchmark (DBH) value: 43	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 2	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 12

Eucalyptus acmenoides, Lophostemon confertus (brush box), Corymbia citriodora (spotted gum), Eucalyptus propinqua (small-fruited grey gum), Eucalyptus siderophloia, Acacia fimbriata (Brisbane golden wattle), Lophostemon suaveolens (swamp box), Acacia disparrima subsp. disparrima, Acacia leiocalyx, Jagera pseudorhus var. pseudorhus, Alphitonia excelsa (soap tree), Eucalyptus moluccana (gum-topped box),

Native shrub species richness (50x10 m) 14

Acacia leiocalyx, Alphitonia excelsa (soap tree), Leucopogon juniperinus (prickly heath), Acacia disparrima subsp. disparrima, Eucalyptus sp 1. (seedling), Acacia fimbriata (Brisbane golden wattle), Eucalyptus sp 2. (seedling), Alphitonia excelsa (soap tree), Glochidion ferdinandi, Lophostemon confertus, Polyscias elegans, Austrosteenisia blackii , Acacia maidenii, Wikstroemia indica

Native grass species richness (50x10 m) 10

Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Enteropogon acicularis, Oplismenus aemulus (creeping shade grass), Imperata cylindrica, Digitaria parviflora, Themeda triandra, Panicum diffusum, Chrysopogon fallax, Ottochloa gracillima

Native forbs/others species richness (50x10 m) 12

Lomandra confertifolia subsp. pallida, Lomandra multiflora, Desmodium rhytidophyllum, Glycine sp, Dianella caerulea, Eustrephus latifolius (wombat berry), Cheilanthes sieberiana, Sigesbeckia orientalis, Adiantum sp., Lobelia purpurascens, Solanum gympiense, Parsonsia straminea

Non-native plant cover (50x10 m): 68

Coarse woody debris (50x20 m): 75

Coarse woody debris lengths (m): 75

Quadrat 1

Native perennial grass cover: 5	**Organic litter cover:** 75
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 2

Native perennial grass cover: 0	**Organic litter cover:** 90
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 3	
Native perennial grass cover: 30	**Organic litter cover:** 10
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 50	**Organic litter cover:** 20
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 65
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North West	**Transect length:** 100m
Canopy: 24 m	
Sub-canopy: 69 m	
Shrub: 9 m	
Photos	
Point: 152.63414383799764, -26.064502149600205	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: N8 - 1	**Date**: 28/03/22 01:45PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 889CP864404		**UIN**: 201006134940	
GTRE: 12.11.5e - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 28 **Sub-canopy:** 11.2			
EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 3	**Percentage recruiting:** 100
Number of large trees (100x50 m): 4			
Large eucalypt benchmark (DBH) value: 43		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 4		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 10			
Eucalyptus acmenoides, Corymbia citriodora (spotted gum), Eucalyptus propinqua (small-fruited grey gum), Acacia disparrima subsp. disparrima, Eucalyptus siderophloia, Corymbia intermedia (pink bloodwood), Lophostemon suaveolens (swamp box), Alphitonia excelsa (soap tree), Lophostemon confertus (brush box), Angophora leiocarpa (rusty gum)			
Native shrub species richness (50x10 m) 9			
Acacia disparrima subsp. disparrima, Corymbia citriodora, Daviesia ulicifolia, Xanthorrhoea johnsonii, Acacia leiocalyx, Leucopogon juniperinus, Alphitonia excelsa (soap tree), Jacksonia scoparia, Eucalyptus acmenioides			
Native grass species richness (50x10 m) 8			
Panicum effusum, Entolasia stricta (wiry panic), Cymbopogon refractus (barbed-wire grass), Aristida sp., Themeda triandra (kangaroo grass), Digitaria parviflora, Alloteropsis semialata, Eragrostis sp.			
Native forbs/others species richness (50x10 m) 6			
Lomandra confertifolia subsp. pallida, Lomandra multiflora, Dianella caerulea, Desmodium rhytidophyllum, Glycine sp., Lobelia purpurascens			
Non-native plant cover (50x10 m): 5			
Coarse woody debris (50x20 m): 11			
Coarse woody debris lengths (m): 11			
Quadrat 1			
Native perennial grass cover: 25		**Organic litter cover:** 75	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 10		**Organic litter cover:** 60	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 5		**Organic litter cover:** 80	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	

Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 25	**Organic litter cover:** 65
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 80
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: Not present	
Sub-canopy: 71 m	
Shrub: 4 m	
Photos	
Point: 152.60552205588513, -26.05730263466647	
Photo North: 	
Photo East: 	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N9 - 1	**Date**: 30/03/22 9:15AM	**Recorder**: Peter Moonie
Locality/Land parcel: 3MPH23906		**UIN**: 201008105805
GTRE: 12.11.5/12.11.3a. 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics. 12.11.3a - Lophostemon confertus +/- Eucalyptus microcorys, E. carnea, E. propinqua, E. major, E. siderophloia woodland. Note: RE more closely aligned to 12.3.11		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 6 **Sub-canopy:** 0		

EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 100

Number of large trees (100x50 m): 0	
Large eucalypt benchmark (DBH) value: 49	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 0	**Number of large non-eucalypt:** 0
Native tree species richness (100x50 m) 4	
Acacia leiocalyx, Acacia disparrima, Melaleuca salicina, Eucalyptus tereticornis	
Native shrub species richness (50x10 m) 0	
Native grass species richness (50x10 m) 3	
Imperata cylindrica (blady grass), Bothriochloa bladhii	
Native forbs/others species richness (50x10 m) 11	
Centella asiatica, Polymeria calycina (pink bindweed), Lobelia purpurascens (white root), Philydrum lanuginosum (frogsmouth), Juncus continuus, Sphaeromorphaea australis, Cyperus polystachyos, Fimbristylis dichotoma, Cyperus sp. 2, Cyperus sp. 3, Cyperus exaltatus	
Non-native plant cover (50x10 m): 60	
Coarse woody debris (50x20 m): 0	
Coarse woody debris lengths (m): 0	
Quadrat 1	
Native perennial grass cover: 90	**Organic litter cover:** 5
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 2	
Native perennial grass cover: 70	**Organic litter cover:** 5
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 50	**Organic litter cover:** 5
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	

Native perennial grass cover: 60	**Organic litter cover:** 0
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 60	**Organic litter cover:** 5
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South West	**Transect length:** 100m
Canopy: 0 m	
Sub-canopy: 0 m	
Shrub: 0 m	
Photos	
Point: 152.6335733283184, -26.06704200584743	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: RE in quadrat more closely aligned to 12.3.11 and this should be reflected in planting list. Reveg program required to improve biocondition score. Stop slashing blade grass. Have not included Lower tree layer in canopy cover as it is not reflective of the benchmark canopy layer.

Site: C1 - 1	**Date**: 30/03/22 3:30PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 1MPH23904		**UIN**: 201009110257	
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 25 **Sub-canopy:** 10			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 50
Number of large trees (100x50 m): 6			
Large eucalypt benchmark (DBH) value: 43		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 6		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 11			
Eucalyptus acmenoides, Corymbia citriodora (spotted gum), Lophostemon suaveolens (swamp box), Syncarpia glomulifera, Eucalyptus siderophloia, Polyscias elegans (celery wood), Eucalyptus moluccana (gum-topped box), Acacia disparrima, Alphitonia excelsa (soap tree), Eucalyptus propinqua (small-fruited grey gum), Lophostemon confertus			
Native shrub species richness (50x10 m) 5			
Lophostemon confertus (brush box), Acacia leiocalyx, Acacia disparrima, Alphitonia excelsa (soap tree), Euc sp. 1			
Native grass species richness (50x10 m) 9			
Entolasia stricta (wiry panic), Themeda triandra (kangaroo grass), Cymbopogon refractus (barbed-wire grass), Ottochloa gracillima, Digitaria parviflora, Aristida sp., Paspalidium distans, Panicum diffusum, Eragrostis sp.			
Native forbs/others species richness (50x10 m) 12			
Dianella revoluta var. revoluta, Lomandra confertifolia subsp. pallida, Dianella caerulea, Eustrephus latifolius (wombat berry), Pigea stellarioides, Lobelia purpurascens, Cyanthillium cinerea, Cheilanthes sieberiana, Glycine sp., Desmodium rhytidophyllum, Goodenia rotundifolia, Geodorum sp.			
Non-native plant cover (50x10 m): 30			
Coarse woody debris (50x20 m): 52			
Coarse woody debris lengths (m): 52			
Quadrat 1			
Native perennial grass cover: 5		**Organic litter cover:** 90	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 5		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 10		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 25	**Organic litter cover:** 40
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 50	**Organic litter cover:** 30
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North West	**Transect length:** 100m
Canopy: 57 m	
Sub-canopy: 31 m	
Shrub: 10.5 m	
Photos	
Point: 152.677082740755, -26.1641134773285	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: C1 - 2	**Date**: 31/03/22 7:20AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 763MCH5342		**UIN**: 201009132036	
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 23 **Sub-canopy:** 10			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 80
Number of large trees (100x50 m): 8			
Large eucalypt benchmark (DBH) value: 43		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 8		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 12			
Eucalyptus acmenoides, Lophostemon suaveolens (swamp box), Corymbia citriodora (spotted gum), Lophostemon confertus (brush box), Acacia disparrima, Allocasuarina torulosa, Eucalyptus siderophloia, Acacia leiocalyx, Eucalyptus propinqua (small-fruited grey gum), Melaleuca salicina, Eucalyptus moluccana (gum-topped box), Syncarpia glomulifera, Angophora leiocarpa			
Native shrub species richness (50x10 m) 9			
Acacia disparrima, Acacia leiocalyx, Lophostemon suaveolens (swamp box), Lophostemon confertus (seedling), Myrsine angusta, Carissa ovata (currantbush), Acacia maidenii (Maiden's wattle), Eucalyptus moluccana, Eucalyptus sp. 2			
Native grass species richness (50x10 m) 8			
Entolasia stricta (wiry panic), Themeda triandra (kangaroo grass), Eragrostis sp., Panicum effusum, Cymbopogon refractus (barbed-wire grass), Aristida sp., Imperata cylindrica, Digitaria parviflora			
Native forbs/others species richness (50x10 m) 13			
Lomandra confertifolia subsp. pallida, Dianella caerulea, Goodenia rotundifolia, Dianella brevipedunculata, Lomandra longifolia, Eustrephus latifolius (wombat berry), Cyanthillium cinerea, Carex sp., Desmodium rhytidophyllum, Lobelia purpurascens, Glycine sp., Pigea stellarioides			
Non-native plant cover (50x10 m): 1			
Coarse woody debris (50x20 m): 72			
Coarse woody debris lengths (m): 72			
Quadrat 1			
Native perennial grass cover: 90		**Organic litter cover:** 5	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 50		**Organic litter cover:** 2	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 40		**Organic litter cover:** 30	
Native other grass: None		Native forbs: None	

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 70	**Organic litter cover:** 20
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 55	**Organic litter cover:** 35
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South East	**Transect length:** 100m
Canopy: 42 m	
Sub-canopy: 35 m	
Shrub: 24 m	
Photos	
Point: 152.67782303448809, -26.15863571986914	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: C2 - 1	**Date**: 31/03/22 9:00AM	**Recorder**: Peter Moonie
Locality/Land parcel: 19SP299683		**UIN**: 201009073035

GTRE: 12.3.11 - Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast

Median tree canopy heights (m):
Emergent: None **Canopy:** 22 **Sub-canopy:** 8

EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 66.6666666666667

Number of large trees (100x50 m): 4

Large eucalypt benchmark (DBH) value: 49	**Large non-eucalypt benchmark (DBH) value:** 36
Number of large eucalypt: 4	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 22

Acacia disparrima, Eucalyptus propinqua (small-fruited grey gum), Eucalyptus siderophloia, Corymbia intermedia (pink bloodwood), Eucalyptus acmenoides, Lophostemon suaveolens (swamp box), Polyscias elegans (celery wood), Astrotricha latifolia, Melaleuca salicina, Acacia oshanesii, Lophostemon confertus (brush box), Psychotria daphnoides, Alchornea ilicifolia (native holly), Elaeodendron australe, Diospyros germinata, Croton insularis, Jagera pseudorhus var. pseudorhus, Cyclophyllum coprosmoides, Flindersia schottiana, Pilidiostigma rhytispermum, Syncarpia glomulifera, Petalostigma triloculare

Native shrub species richness (50x10 m) 25

Melaleuca salicina, Acacia disparrima subsp. disparrima, Astrotricha latifolia, Carissa ovata (currantbush), Leucopogon juniperinus (prickly heath), Alphitonia excelsa (soap tree), Diospyros germinata, Polyscias elegans (celery wood), Psychotria daphnoides, Alchornea ilicifolia (native holly), Acalypha nemorum (hairy acalypha), Cupaniopsis parvifolia (small-leaved tuckeroo), Myrsine angusta, Pilidiostigma rhytispermum, Alyxia ruscifolia, Mallotus philippensis (red kamala), Cyclophyllum coprosmoides, Croton verreaux, Backhousia myrtifolia, Acronychia laevis, Acacia oshanesii, Myrsine variabilis, Trema tomentosa, Lophostemon confertus, Melia azedarach

Native grass species richness (50x10 m) 3

Ottochloa gracillima (pademelon grass), Oplismenus aemulus (creeping shade grass), Entolasia stricta (wiry panic)

Native forbs/others species richness (50x10 m) 13

Lomandra confertifolia subsp. pallida, Dianella caerulea, Lomandra longifolia, Cissus antarctica, Smilax australis (barbed-wire vine), Geitonoplesium cymosum (scrambling lily), Cyanthillium cinereum, Lepidosperma laterale, Eustrephus latifolius (wombat berry), Gymnostachys anceps (settler's flax) , Lobelia purpureus, Cayratia clematidea, Pigea stellarioides

Non-native plant cover (50x10 m): 22

Coarse woody debris (50x20 m): 96

Coarse woody debris lengths (m): 96

Quadrat 1

Native perennial grass cover: 5	**Organic litter cover:** 80
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 2

Native perennial grass cover: 80	**Organic litter cover:** 10
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None

Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 10	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 15	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 40	**Organic litter cover:** 50
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 60 m	
Sub-canopy: 78 m	
Shrub: 24 m	
Photos	
Point: 152.6829905103608, -26.156238188951676	
Transect Start:	
Note: None	
Point: 152.68337218348276, -26.155875962085503	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: S1 - 1	**Date**: 31/03/22 11:00AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 102SP297908		**UIN**: 201011094140	
GTRE: 12.3.11. Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast **Note:** Partially within 12.11.3 but still representative of 12.3.11 at location of plot.			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 26 **Sub-canopy:** 11			
EDL:	**No. of dominant species in the EDL**: 1	**No. of dominant species in the EDL recruiting:** 0	**Percentage recruiting:** 0
Number of large trees (100x50 m): 3			
Large eucalypt benchmark (DBH) value: 49		**Large non-eucalypt benchmark (DBH) value:** 39	
Number of large eucalypt: 3		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 12			
Eucalyptus tereticornis, Lophostemon suaveolens (swamp box), Alphitonia excelsa (soap tree), Acacia disparrima, Mallotus philippensis (red kamala), Jagera pseudorhus, Aphananthe philippinensis, Cryptocarya triplinervis, Melaleuca salicina, Streblus brunonianus (whalebone tree), Acacia maidenii (Maiden's wattle), Maclura cochinchinensis			
Native shrub species richness (50x10 m) 9			
Cryptocarya triplinervis, Alphitonia excelsa (soap tree), Psychotria daphnoides, Sp.1, Lophostemon suaveolens (swamp box), Maclura cochinchinensis (cockspur thorn), Cupaniopsis parvifolia (small-leaved tuckeroo), Aphananthe philippinensis, Glochidion ferdinandi			
Native grass species richness (50x10 m) 2			
Imperata cylindrica (blady grass), Paspalidium distans			
Native forbs/others species richness (50x10 m) 8			
Lomandra filiformis, Lomandra longifolia, Smilax australis (barbed-wire vine), Sp1. (vine), Eustrephus latifolius (wombat berry), Commelina diffusa, Gahnia aspera, Geitonoplesium cymosum			
Non-native plant cover (50x10 m): 1			
Coarse woody debris (50x20 m): 6			
Coarse woody debris lengths (m): 6			
Quadrat 1			
Native perennial grass cover: 25		**Organic litter cover:** 15	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 15		**Organic litter cover:** 50	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 15		**Organic litter cover:** 90	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	

Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 20	**Organic litter cover:** 80
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 20	**Organic litter cover:** 60
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: West	**Transect length:** 100m
Canopy: 64 m	
Sub-canopy: 85 m	
Shrub: 16 m	
Photos	
Point: 152.70189262021674, -26.23822312068297	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: Transect started outside of mapped RE but considered okay as mapping boundary was slightly inaccurate and E. tereticornis was the dominant tree in the AU at this location.
Silt deposit on foliage. Flood level 2-3 m identified by flood staining on tree trunks. Runoff from fill/road base in plot from nearby road bypass construction.

Site: S2 – 1	**Date**: 31/03/22 12:15PM	**Recorder**: Peter Moonie	
Locality/Land parcel: 102SP297908		**UIN**: 201011122619	
GTRE: 12.11.3 - Eucalyptus siderophloia, E. propinqua +/- E. microcorys, Lophostemon confertus, Corymbia intermedia, E. acmenoides open forest on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 23 **Sub-canopy:** 11			
EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 66.6666666666667
Number of large trees (100x50 m): 2			
Large eucalypt benchmark (DBH) value: 45		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 2		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 29			
Lophostemon suaveolens (swamp box), Acacia disparrima, Eucalyptus propinqua (small-fruited grey gum), Eucalyptus siderophloia, Cupaniopsis anacardioides (tuckeroo), Rhodosphaera rhodanthema (tulip satinwood), Cupaniopsis parvifolia (small-leaved tuckeroo), Meliocope micrococca, Eucalyptus tereticornis, Planchonella pohlmaniana, Sp2, Alyxia ruscifolia, Leucopogon juniperinus (prickly heath), Denhamia bilocularis, Myrsine variabilis, Alectryon reticulatis, Jagera pseudorhus, Sp3, Polyscias elegans (celery wood), Petalostigma triloculare (forest quinine), Lophostemon confertus (brush box), Everistia vacciniifolia, Pilidiostigma rhytispermum, Alchornea ilicifolia (native holly), Carissa ovata (currantbush), Pittosporum undulatum (sweet pittosporum), Flindersia schottiana, Acacia leiocalyx , Brachychiton acerifolius			
Native shrub species richness (50x10 m) 30			
Alyxia ruscifolia, Acacia disparrima subsp. disparrima, Denhamia bilocularis, Acacia complanata (flatstem wattle), Carissa ovata (currantbush), Tabernaemontana pandacaqui (banana bush), Cyclophyllum coprosmoides, Solanum stelligerum (devil's needles), Cupaniopsis parvifolia (small-leaved tuckeroo), Myrsine variabilis, Leucopogon juniperinus (prickly heath), Diospyros geminata, ?Diospyros fasciculosa, Petalostigma triloculare, Myrsine angusta, Alphitonia excelsa , Pittosporum undulatum , Melicope micrococca, Eucalyptus sp., Everistia vacciniifolia , Breynia oblongifolia, Pavetta australis, Hibiscus heterophyllus, Trema tomentosa, Cupaniopsis anacardioides, Elattostachys sp., Psychotria daphnoides , Elaeodendron australe, Jagera pseudorhus, Clerodendron floribunda			
Native grass species richness (50x10 m) 4			
Eneteropogon sp., Ottochloa gracimila, Entolasia stricta, Chrysopogon fallax			
Native forbs/others species richness (50x10 m) 10			
Dianella caerulea, Lomandra filiformis, Lomandra multiflora, Lomandra confertifolia subsp. pallida, Smilax australis (barbed-wire vine), Pseuderanthemum variable, vine sp., Geitonoplesium cymosum, Pygea stellarioides, Cyanthillium cinereum			
Non-native plant cover (50x10 m): 9			
Coarse woody debris (50x20 m): 135			
Coarse woody debris lengths (m): 135			
Quadrat 1			
Native perennial grass cover: 40		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 25		**Organic litter cover:** 60	

Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 50	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 5	**Organic litter cover:** 10
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 75	**Organic litter cover:** 15
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 34 m	
Sub-canopy: 81 m	
Shrub: 8 m	
Photos	
Point: 152.70305455220608, -26.24031949056037	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect End:

Note: None

Site: S2 - 2	**Date**: 31/03/22 3:45PM	**Recorder**: Peter Moonie
Locality/Land parcel: 102SP297908		**UIN**: 201013084125
GTRE: 12.11.3 - Eucalyptus siderophloia, E. propinqua +/- E. microcorys, Lophostemon confertus, Corymbia intermedia, E. acmenoides open forest on metamorphics +/- interbedded volcanics		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 22 **Sub-canopy:** 12		

EDL:	**No. of dominant species in the EDL**: 2	**No. of dominant species in the EDL recruiting:** 1	**Percentage recruiting:** 50

Number of large trees (100x50 m): 6	
Large eucalypt benchmark (DBH) value: 45	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 6	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 30

Eucalyptus siderophloia, Eucalyptus propinqua (small-fruited grey gum), Melaleuca salicina, Sp. 1, Elaedendron australe, Elattostachys bidwillii, Acacia disparrima, Polyscias elegans (celery wood), Corymbia intermedia (pink bloodwood), Alphitonia excelsa (soap tree), Aphananthe philippinensis, Cyclophyllum coprosmoides, Lophostemon suaveolens (swamp box), Alyxia ruscifolia, Acacia complanata (flatstem wattle), Mallotus philippensis (red kamala), Jagera pseudorhus, Eucalyptus tereticornis, Diospyros fasiculosa, Elattostachys nervosa, Alchornea ilicifolia (native holly), Actephila lindleyi, Diospyros germinata, Cryptocarya triplinervis, Cupaniopsis parvifolia (small-leaved tuckeroo), Lophostemon confertus (brush box), Pittosporum revolutum (yellow pittosporum), Melicope micrococca (white evodia), ?Castanospermum australe, Grevillea robusta

Native shrub species richness (50x10 m) 21

Alyxia ruscifolia, Denhamia bilocularis, Carissa ovata (currantbush), Cupaniopsis parvifolia (small-leaved tuckeroo), Myrsine variabilis, Acacia disparrima, Cryptocarya triplinervis, Tabernaemontana pandacaqui (banana bush), Polyscias elegans (celery wood), Cyclophyllum coprosmoides, Alphitonia excelsa (soap tree), Lophostemon suaveolens (swamp box), Myrsine angusta, Clerodendrum floribundum, Eucalyptus sp., Aphananthe philippinensis , Psychotria daphnoides , Pavetta australis, Pittosporum undulatum , Trophis scandens, Austrosteenisia blackii

Native grass species richness (50x10 m) 7

Enteropogon sp., Entolasia stricta (wiry panic), Oplismenus aemulus, Cymbopogon refractus, Imperata cylindrica, Ottochloa gracillima, Chrysopogon fallax

Native forbs/others species richness (50x10 m) 10

Smilax australis (barbed-wire vine), Gahnia aspera, Geitonoplesium cymosum (scrambling lily), Dianella caerulea, Lomandra multiflora, Gymnostachys anceps (settler's flax), Lomandra filiformis, Eustrephus latifolius (wombat berry), Trophis scandens, Cyperus sp 1.

Non-native plant cover (50x10 m): 21

Coarse woody debris (50x20 m): 68

Coarse woody debris lengths (m): 68

Quadrat 1

Native perennial grass cover: 5	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	

Quadrat 2

Native perennial grass cover: 15	**Organic litter cover:** 70
Native other grass: None	Native forbs: None

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 10	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 50	**Organic litter cover:** 40
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 80
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North West	**Transect length:** 100m
Canopy: 53 m	
Sub-canopy: 78.5 m	
Shrub: 41 m	
Photos	
Point: 152.7017619512238, -26.241598040828517	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect End:

Note: None

Site: S3 - 1	**Date**: 01/04/22 9:20AM	**Recorder**: Peter Moonie	
Locality/Land parcel: 3SP302524		**UIN**: 201010104514	
GTRE: 12.11.3 - Eucalyptus siderophloia, E. propinqua +/- E. microcorys, Lophostemon confertus, Corymbia intermedia, E. acmenoides open forest on metamorphics +/- interbedded volcanics			
Median tree canopy heights (m): **Emergent:** None **Canopy:** 23 **Sub-canopy:** 13			
EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 4	**Percentage recruiting:** 100
Number of large trees (100x50 m): 3			
Large eucalypt benchmark (DBH) value: 45		**Large non-eucalypt benchmark (DBH) value:** None	
Number of large eucalypt: 3		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 14			
Corymbia citriodora (spotted gum), Acacia disparrima, Eucalyptus propinqua (small-fruited grey gum), Lophostemon confertus (brush box), Alphitonia excelsa (soap tree), Clerodendrum floribundum, Polyscias elegans (celery wood), Cyclophyllum coprosmoides, Jagera pseudorhus, Acacia complanata (flatstem wattle), Araucaria cunninghamii (hoop pine), Eucalyptus acmenoides, Alyxia ruscifolia, Acacia oshanesii,			
Native shrub species richness (50x10 m) 8			
Acacia disparrima, Carissa ovata (currantbush), Corymbia citriodora (seedling), Leucopogon juniperinus (prickly heath), Cyclophyllum coprosmoides, Trema tomentosa, Hibiscus heterophyllus, Acacia leiocalyx			
Native grass species richness (50x10 m) 10			
Themeda triandra (kangaroo grass), Aristida sp.1, Entolasia stricta (wiry panic), Enteropogon sp., Cymbopogon refractus (barbed-wire grass), Panicum diffusum, Digitaria parviflora, Ottochloa gracillima, Paspalidium distans, Imperata cylindrica			
Native forbs/others species richness (50x10 m) 10			
Dianella caerulea, Lomandra filiformis, Desmodium rhytidophyllum, Gahnia aspera, Cyanthillium cinereum, Sigesbeckia orientalis, Dioscorea sp., Cyperus sp. 1, Cyperus sp.2, Lomandra multiflora			
Non-native plant cover (50x10 m): 25			
Coarse woody debris (50x20 m): 23			
Coarse woody debris lengths (m): 23			
Quadrat 1			
Native perennial grass cover: 40		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 2			
Native perennial grass cover: 5		**Organic litter cover:** 90	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	
Non-native forbs and shrubs: None		Rock: None	
Bare Ground: None		Cryptograms: None	
Total cover: None			
Quadrat 3			
Native perennial grass cover: 30		**Organic litter cover:** 40	
Native other grass: None		Native forbs: None	
Native shrubs (less than 1 m): None		Non-native grass: None	

Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 10	**Organic litter cover:** 75
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 15	**Organic litter cover:** 70
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: West	**Transect length:** 100m
Canopy: 44 m	
Sub-canopy: 84 m	
Shrub: 4 m	
Photos	
Point: 152.71119129711295, -26.245811893941255	
Photo North: 	
Photo East: 	

Photo South:

Photo West:

Transect End:

Note: Site is mapped 12.11.3 but also has sedimentary geology mixed with metamorphics

Site: S4 – 1	**Date**: 01/04/22 10:20AM	**Recorder**: Peter Moonie
Locality/Land parcel: 3SP302524		**UIN**: 201010125635
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 24 **Sub-canopy:** 10		

EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 66

Number of large trees (100x50 m): 7	
Large eucalypt benchmark (DBH) value: 43	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 7	**Number of large non-eucalypt:** 0
Native tree species richness (100x50 m) 20	
Lophostemon confertus (brush box), Corymbia citriodora (spotted gum), Petalostigma triloculare (forest quinine), Acacia complanata (flatstem wattle), Acacia disparrima, Eucalyptus acmenoides, Acacia fimbriata (Brisbane golden wattle), Diospyros germinata, Eucalyptus propinqua (small-fruited grey gum), ?Flindersia australis, Acronychia laevis, Eucalyptus siderophloia, Rhodosphaera rhodanthema, Polyscias elegans (celery wood), Leucopogon juniperinus (prickly heath), Cupaniopsis parvifolia (small-leaved tuckeroo), Bridelia leichhardtii, Mallotus philippensis (red kamala), Acacia maidenii (Maiden's wattle), Cyclophyllum coprosmoides	
Native shrub species richness (50x10 m) 22	
Acacia complanata (flatstem wattle), Bridelia leichhardtii, Carissa ovata (currantbush), Acacia disparrima, Alphitonia excelsa (soap tree), Myrsine variabilis, Zieria minutiflora, Acronychia laevis, Polyscias elegans (celery wood), Acacia fimbriata (Brisbane golden wattle), Petalostigma triloculare (forest quinine), Cupaniopsis parvifolia (small-leaved tuckeroo), Denhamia bilocularis, Hovea acutifolia, Rhodosperma rhodanthema, Psychotria daphnoides, Cyclophyllum coprosmoides, Diospyros geminata , Myrsine angulata, Astrotricha latifolia, Lophostemon confertus, Citrus glauca	
Native grass species richness (50x10 m) 2	
Entolasia stricta (wiry panic), Ottochloa gracillima	
Native forbs/others species richness (50x10 m) 18	
Dianella caerulea, Lomandra confertifolia subsp. pallida, Lepidosperma laterale, Solanum gympiense, Marsdenia coronata (slender milkvine), Lomandra multiflora subsp. multiflora, Smilax australis (barbed-wire vine), Lomandra longifolia, Gahnia aspera, Desmodium rhytidophyllum, Lobelia purpureus, Clematicissus opaca, Pigea stellarioides, Pandorea pandorana, Pseuderanthemum variable, Cissus sp., Cyanthillium cinerea, Geitonoplesium cymosum	
Non-native plant cover (50x10 m): 35	
Coarse woody debris (50x20 m): 49	
Coarse woody debris lengths (m): 49	
Quadrat 1	
Native perennial grass cover: 0	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 2	
Native perennial grass cover: 0	**Organic litter cover:** 80
Native other grass: None	Native forbs: None

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 0	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 10	**Organic litter cover:** 90
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 80
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 77 m	
Sub-canopy: 66 m	
Shrub: 29 m	
Photos	
Point: 152.7109043409516, -26.24734729848676	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: Located immediately adjacent to bottom of translocation site so important not to disturb any of the translocated plants which are marked by blue flags

Site: S4 - 2	**Date**: 01/04/22 1:00PM	**Recorder**: Peter Moonie
Locality/Land parcel: 2SP302526		**UIN**: 201013115755

GTRE: 12.11.10 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics
Note: Polygon more accurately mapped as 12.11.5a/12.11.3a

Median tree canopy heights (m):
Emergent: None **Canopy:** 21 **Sub-canopy:** 10

EDL:	**No. of dominant species in the EDL**: 2	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 100

Number of large trees (100x50 m): 2

Large eucalypt benchmark (DBH) value: 43	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 2	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 32

Polyalthia nitidissima, Corymbia citriodora (spotted gum), Alphitonia excelsa (soap tree), Lophostemon confertus (brush box), Acacia disparrima, Cupaniopsis parvifolia (small-leaved tuckeroo), Diospyros geminata (scaly ebony), Polyscias elegans (celery wood), Acacia fimbriata (Brisbane golden wattle), Pittosporum revolutum, Cyclophyllum coprosmoides, Acacia maidenii (Maiden's wattle), Eucalyptus propinqua (small-fruited grey gum), Acacia leiocalyx, Acacia oshanesii, Jagera pseudorhus, Eucalyptus acmenoides, Bursaria spinosa subsp. spinosa, other, Mallotus philippensis (red kamala), Petalostigma triloculare (forest quinine), Alyxia ruscifolia, Planchonella cotinifolia/Denhamia disperma, Eucalyptus siderophloia, Hibiscus heterophyllus, Atalaya multiflora, Acronychia laevis, Flindersia australis, Citrus australis, Rhodosphaera rhodanthema, Diospyros fasciculosa, Drypetes deplanchei

Native shrub species richness (50x10 m) 31

Acacia disparrima, Acacia oshanesii, Carissa ovata (currantbush), Alyxia ruscifolia, Denhamia bilocularis, Alphitonia excelsa (soap tree), Cyclophyllum coprosmoides, Citrus australis, Atalaya multiflora, Diospyros australis (black plum), Polyscias elegans (celery wood), Cupaniopsis parvifolia (small-leaved tuckeroo), Jagera pseudorhus, Sapindaceae sp. (angled grey stem), ?Myrsine sp., Solanum stelligerum, Ziera sp., Mallotus philippensis, Rhodosphaera rhodanthema, Breynia oblongifolia, Hibiscus heterophylla, Cupaniopsis ?shirleyana, Psychotria daphnoides, Pavetta australiensis, Lophostemon confertus, Jasminum simplicifolium, Trema tomentosa, Eucalyptus sp., Clerodendrum floribundum, Tabernaemontana pandacaqui, Achyranthes aspera

Native grass species richness (50x10 m) 2

Ottochloa sp (indet), Oplismenus aemulus

Native forbs/others species richness (50x10 m) 13

Dianella caerulea, Gahnia aspera, Eustrephus latifolius (wombat berry), Marsdenia lloydii, Smilax australis (barbed-wire vine), Clematicissus opaca, Einadia nutans, Cayratia clematidea, Cissus sp., Marsdenia coronata, Commelina cyanea, Sigesbeckia orientalis, Cyperus gracilis

Non-native plant cover (50x10 m): 80

Coarse woody debris (50x20 m): 116

Coarse woody debris lengths (m): 116

Quadrat 1

Native perennial grass cover: 0	**Organic litter cover:** 70
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 2	
Native perennial grass cover: 0	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 0	**Organic litter cover:** 100
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 0	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 20	**Organic litter cover:** 70
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North West	**Transect length:** 100m
Canopy: 55 m	
Sub-canopy: 60 m	
Shrub: 20 m	
Photos	
Point: 152.71137124326978, -26.249486009937343	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: Lantana was prevalent at site but had been treated and most was dead l. Polygon was mix of 12.11.5 and 12.11.3a

Site: S4 - 3	**Date**: 01/04/22 2:35PM	**Recorder**: Peter Moonie
Locality/Land parcel: 2SP302526		**UIN**: 201013144009

GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics

Median tree canopy heights (m):
Emergent: None **Canopy:** 24 **Sub-canopy:** 10

EDL:	**No. of dominant species in the EDL**: 4	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 100

Number of large trees (100x50 m): 4

Large eucalypt benchmark (DBH) value: 43	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 4	**Number of large non-eucalypt:** 0

Native tree species richness (100x50 m) 28

Lophostemon confertus (brush box), Corymbia citriodora (spotted gum), Polyscias elegans (celery wood), Jagera pseudorhus, Alphitonia excelsa (soap tree), Acacia oshanesii, Acacia disparrima, Eucalyptus propinqua (small-fruited grey gum), Acacia fimbriata (Brisbane golden wattle), Denhamia bilocularis, Cupaniopsis parvifolia (small-leaved tuckeroo), Polyalthia nitidissima, Acronychia laevis, Cyclophyllum coprosmoides, ?Guioa semiglauca, Flindersia sp, Eleocarpus sp., Atalaya multiflora, Diospyros deplanchii, Rhodosphaera rhodanthema (tulip satinwood), Diospyros geminata (scaly ebony), Jagera pseudorhus, Sapindaceae sp. (swollen petiole), Mallotus philippensis (red kamala), Pentaceras australis, Eucalyptus siderophloia, Acacia maidenii (Maiden's wattle), Astrotricha latifolia

Native shrub species richness (50x10 m) 20

Polyalthia nitidissima, Diospyros geminata (scaly ebony), Carissa ovata (currantbush), Acacia disparrima, Rhodosphaera rhodanthema (tulip satinwood), Cyclophyllum coprosmoides, Alyxia ruscifolia, Cupaniopsis parvifolia (small-leaved tuckeroo), Clerodendrum floribundum, Acacia fimbriata (Brisbane golden wattle), Lophostemon confertus, Pavetta australiana, Alphitonia excelsa, Myrsine variabilis, Acacia maidenii, Polyscias elegans, Drypetes deplanchei, Guioa semiglauca, Hibiscus heterophyllus, Acronychia laevis

Native grass species richness (50x10 m) 7

Cymbopogon refractus (barbed-wire grass), Imperata cylindrica (blady grass), Entolasia stricta (wiry panic), Aristida sp., Digitaria parviflora, Ottochloa gracillima, Oplismenus aemulus

Native forbs/others species richness (50x10 m) 12

Smilax australis (barbed-wire vine), Lomandra longifolia, Secamone elliptica, Gahnia aspera, Dianella caerulea, Clematicissus opaca, Sigesbeckia orientalis, Abutilon oxycarpum, Cyanthillium cinerea, Marsdenia coronata, Pandorea pandorana, Solanum stelligerum

Non-native plant cover (50x10 m): 60

Coarse woody debris (50x20 m): 140

Coarse woody debris lengths (m): 140

Quadrat 1

Native perennial grass cover: 0	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None

Total cover: None

Quadrat 2

Native perennial grass cover: 20	**Organic litter cover:** 50
Native other grass: None	Native forbs: None

Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 0	**Organic litter cover:** 75
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 15	**Organic litter cover:** 60
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 10	**Organic litter cover:** 90
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: North East	**Transect length:** 100m
Canopy: 41 m	
Sub-canopy: 62	
Shrub: 25 m	
Photos	
Point: 152.71301166997873, -26.25167578045187	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: S5 – 1	**Date**: 01/04/22 8:00AM	**Recorder**: Peter Moonie
Locality/Land parcel: 3SP302524		**UIN**: 201010072247
GTRE: 12.11.5 - Corymbia citriodora subsp. variegata woodland to open forest +/- Eucalyptus siderophloia/E. crebra, E. carnea, E. acmenoides, E. propinqua on metamorphics +/- interbedded volcanics		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 20 **Sub-canopy:** 11		

EDL:	**No. of dominant species in the EDL**: 2	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 100

Number of large trees (100x50 m): 2	
Large eucalypt benchmark (DBH) value: 43	**Large non-eucalypt benchmark (DBH) value:** None
Number of large eucalypt: 2	**Number of large non-eucalypt:** 0
Native tree species richness (100x50 m) 14	
Corymbia citriodora (spotted gum), Acacia disparrima subsp. disparrima, Eucalyptus acmenoides, Jacksonia scoparia, Acacia leiocalyx, Corymbia intermedia (pink bloodwood), Eucalyptus propinqua (small-fruited grey gum), Eucalyptus siderophloia, Bursaria incana, Alphitonia excelsa (soap tree), Polyscias elegans (celery wood), Lophostemon confertus (brush box), Cyclophyllum coprosmoides, Acacia penninervis	
Native shrub species richness (50x10 m) 9	
Acacia disparrima, Grewia latifolia (dysentery plant), Leucopogon juniperinus (prickly heath), Eucalyptus sp1. (seedling), Alphitonia excelsa (soap tree), Cupaniopsis parvifolia (small-leaved tuckeroo), Acacia penninervis, Clerodendrum floribunda, Psydrax odorata	
Native grass species richness (50x10 m) 10	
Cymbopogon refractus (barbed-wire grass), Aristida sp1., Eragrostis tenuifolia, Aristida sp. 2, Entolasia stricta (wiry panic), Ottochloa gracillima, Digitaria parviflora, Enteropogon acicularis, Imperata cylindrica, Paspalidium distans	
Native forbs/others species richness (50x10 m) 11	
Smilax australis (barbed-wire vine), Sida hackettiana, Dianella caerulea, Lomandra confertifolia subsp. pallida, Solanum gympiense, Cyperus gracilis, Gahnia aspera, Cyanthillium cinerea, Cyperus sp. 2, Desmodium rhytidophyllum, Cayratia clematidea	
Non-native plant cover (50x10 m): 65	
Coarse woody debris (50x20 m): 27	
Coarse woody debris lengths (m): 27	
Quadrat 1	
Native perennial grass cover: 5	**Organic litter cover:** 70
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 2	
Native perennial grass cover: 30	**Organic litter cover:** 50
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 0	**Organic litter cover:** 80

Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 5	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 5	**Organic litter cover:** 90
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: East	**Transect length:** 100m
Canopy: 31 m	
Sub-canopy: 61 m	
Shrub: 12 m	
Photos	
Point: 152.71017906569563, -26.244336692029147	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: S7 - 1	**Date**: 31/03/22 2:25PM	**Recorder**: Peter Moonie
Note: Transect size reduced to 100m x 30 m - adjust calculations accordingly		
Locality/Land parcel: 102SP297908		**UIN**: 201011070651
GTRE: 12.5.2 - Corymbia intermedia, Eucalyptus tereticornis open forest on remnant Tertiary surfaces, usually near coast. Usually deep red soils		
Median tree canopy heights (m): **Emergent:** None **Canopy:** 22 **Sub-canopy:** 9		

EDL:	**No. of dominant species in the EDL**: 2	**No. of dominant species in the EDL recruiting:** 1	**Percentage recruiting:** 50

Number of large trees (100x50 m): 7	
Large eucalypt benchmark (DBH) value: 41	**Large non-eucalypt benchmark (DBH) value:** 22
Number of large eucalypt: 7	**Number of large non-eucalypt:** 0
Native tree species richness (100x50 m) 20	
Corymbia intermedia (pink bloodwood), Eucalyptus tereticornis, Lophostemon suaveolens (swamp box), Alphitonia excelsa (soap tree), Acacia disparrima, Cyclophyllum coprosmoides, Acacia leiocalyx, Jagera pseudorhus, Angophora subvelutina, Polyscias elegans (celery wood), Cryptocarya triplinervis, Maclura cochinchinensis (cockspur thorn), Sp.(large stiff leaf, discolourous), Ficus watkinsiana, Mallotus philippensis (red kamala), Aphananthe philippinensis, Eucalyptus siderophloia, Clerodendrum floribundum, Pilidiostigma rhytispermum, Jagera pseudorhus	
Native shrub species richness (50x10 m) 24	
Lophostemon suaveolens (swamp box), Acacia leiocalyx, Maclura cochinchinensis (cockspur thorn), Cupaniopsis parvifolia (small-leaved tuckeroo), Diospyros germinata, Carissa ovata (currantbush), Eucalyptus sp.1 (seedling), Alphitonia excelsa (soap tree), Psychotria daphnoides, Aphananthe philippinensis, Alyxia ruscifolia, Cryptocarya triplinervis, Acacia disparrima, Cyclophyllum coprosmoides, Myrsine variabilis, Grewia latifolia (dysentery plant), Polyscias elegans (celery wood), Everistia vacciniifolia, Grevillea robusta, Glochidion ferdinandi, Mallotus philippensis, Pittosporum revolutum, Jagera pseudorhus, Clerodendrum floribundum	
Native grass species richness (50x10 m) 3	
Imperata cylindrica (blady grass), Ottochloa sp., Oplismenus aemulus	
Native forbs/others species richness (50x10 m) 10	
Dianella caerulea, Lomandra longifolia, Eustrephus latifolius (wombat berry), Smilax australis (barbed-wire vine), Parsonsia straminea (monkey rope), Geitonoplesium cymosum (scrambling lily), Commelina cyanea, Gahnia aspera, Cyperus sp., Stephania japonica	
Non-native plant cover (50x10 m): 25	
Coarse woody debris (50x20 m): 28	
Coarse woody debris lengths (m): 28	
Quadrat 1	
Native perennial grass cover: 50	**Organic litter cover:** 30
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 2	
Native perennial grass cover: 80	**Organic litter cover:** 15
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None

Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 3	
Native perennial grass cover: 70	**Organic litter cover:** 20
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Quadrat 4	
Native perennial grass cover: 5	**Organic litter cover:** 90
Native other grass: None	Native forbs: None
Native shrubs (less than 1 m): None	Non-native grass: None
Non-native forbs and shrubs: None	Rock: None
Bare Ground: None	Cryptograms: None
Total cover: None	
Quadrat 5	
Native perennial grass cover: 15	**Organic litter cover:** 75
Native other grass: None	**Native forbs:** None
Native shrubs (less than 1 m): None	**Non-native grass:** None
Non-native forbs and shrubs: None	**Rock:** None
Bare Ground: None	**Cryptograms:** None
Total cover: None	
Transect	
Plot bearing: South East	**Transect length:** Other100x30
Canopy: 56 m	
Sub-canopy: 82 m	
Shrub: 21 m	
Photos	
Point: 152.70011386332777, -26.238455198703974	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: Transect size 100 m x 30 m, transect was reduced due to the limited width of the assessment unit, will need to adjust calculations. Upper canopy was the ecologically dominant layer.

Appendix D

Weed density comparison 2020 vs 2022

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
N3-1	84 	5 	-79
N7-5	55 	77 	22
N7-6	59	80	21

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
			
N7-9	80 	60 	-20
N7-10	22	50	28

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
			
C1-1	70 	90 	20
C1-4	80	9	-71

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Change from 2020 to 2022 (percentage points)
			
S2-1	69 	1.5 	-67.5

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