Biennial Monitoring Report – 2024

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

Department of Transport and Main Roads

19 September 2024

→ **The Power of Commitment**

Project name		Bruce Highway (Cooroy to Curra) Section D - Commonwealth Offset Delivery					
Document title		Biennial Monitoring Report – 2024 | Bruce Highway (Cooroy to Curra) Section D – Commonwealth Offset Delivery					
Project number		12534030					
File name		12534030-REP-Cooroy to Curra Commonwealth Offsets 2024 Biennial Report.docx					
Status Code	**Revision**	**Author**	**Reviewer**		**Approved for issue**		
			Name	**Signature**	**Name**	**Signature**	**Date**
S3	A	S. Hodgkison A. Jones	S. Chadwick	*On file	N. Clark	*On file	24/05/2024
S4	0	S. Hodgkison A. Jones	S. Chadwick	*On file	N. Clark	*On file	23/08/2024
S4	1	A. Jones	S. Chadwick	*On file	N. Clark	*On file	19/09/2024

GHD Pty Ltd | ABN 39 008 488 373
Level 7, Foundation Place, 3 South Sea Islander Way
Maroochydore, Queensland 4558, Australia
T +61 7 5413 8100 | **F** +61 7 3319 6038 | **E** btamail@ghd.com | **ghd.com**

Contents

1. Introduction 1
1.1 Purpose of this report 2
1.2 Scope and limitations 2
1.3 Suitably qualified personnel 3
2. Overview of offset areas 4
2.1 Offset areas summary 4
3. Monitoring methods 10
3.1 Monitoring survey overview 10
3.2 Weather conditions 18
3.3 Guidelines referenced 18
3.4 BioCondition / Habitat quality 19
3.4.1 Site condition 19
3.4.1.1 BioCondition plots 20
3.4.1.2 Quality and availability of food and foraging habitat 21
3.4.1.3 Quality and availability of shelter 22
3.4.2 Site context 22
3.4.2.1 Role of the site location to the overall population in the state 23
3.4.2.2 Threats to the species 24
3.4.2.3 Species mobility capability 24
3.4.2.4 Species stocking rate 25
3.4.3 Koala presence 26
3.4.3.1 Drone koala density surveys 27
3.4.3.2 Localised koala utilisation (SAT) surveys 27
3.4.4 Black-breasted button-quail presence 27
3.5 Weed infestation 28
3.5.1 Desktop survey 28
3.5.2 Field survey 28
3.6 Pest abundance 29
3.7 General site features 29
4. Monitoring results 31
4.1 Habitat quality 31
4.1.1 BioCondition data 31
4.1.1.1 AU scores 31
4.1.1.2 Attribute scores 31
4.1.1.3 Baseline data comparison 36
4.1.2 Site context 37
4.1.2.1 Size of patch 38
4.1.2.2 Connectivity in the landscape 38
4.1.2.3 Landscape context 39
4.1.3 Koala habitat scores 40
4.1.3.1 Quality of foraging habitat 40
4.1.3.2 Quality of shelter 40
4.1.3.3 Threats to species 40
4.1.3.4 Species mobility 41
4.1.3.5 Species stocking rate 41
4.1.3.6 Role/importance of the site to the species population 41
4.1.4 Black-breasted button-quail habitat scores 42

4.1.4.1 Quality of foraging habitat 42
4.1.4.2 Quality of shelter 42
4.1.4.3 Threats to species 43
4.1.4.4 Species mobility 43
4.1.4.5 Species stocking rate 43
4.1.4.6 Role/importance of the site to the species population 44
4.1.5 Habitat quality scores 44
4.2 Koala presence 45
4.2.1 Drone surveys of koala density 45
4.2.2 SAT surveys of local koala utilisation 45
4.3 Black-breasted button-quail presence 51
5. Weed infestation 53
5.1 Weed densities 53
5.2 Baseline data comparison 56
6. Progress towards ecological outcomes 59
6.1 Koala habitat value and density 59
6.2 Black-breasted button-quail habitat value and density 59
6.3 Habitat quality 60
6.3.1 BioCondition 60
6.3.2 Weed infestation 60

Table index

Table 1.1 Relevant Conditions under EPBC2017/7941 1
Table 2.1 Summary of offset areas 4
Table 3.1 Monitoring surveys 10
Table 3.3 Site context scoring criteria 23
Table 3.4 Matrix used to score absence of threats 24
Table 3.5 Criteria used to score species stocking rate 25
Table 3.6 Criteria used to score koala density 26
Table 3.7 Criteria used to score role/importance of the population 26
Table 3.8 Survey methods used to detect koalas 27
Table 3.9 Black-breasted button-quail survey methods 28
Table 3.10 Target weed species 29
Table 4.1 Average attribute scores for respective AUs 33
Table 4.2 Changes in average relative scores across AUs between 2020, 2022, and 2024 36
Table 4.3 Size of patch 38
Table 4.4 Connectedness results 38
Table 4.5 Landscape context results 39
Table 4.6 Scores for koala species stocking rate 41
Table 4.7 Role/importance of the species population 42
Table 4.8 Scores for black-breasted button-quail species stocking rate 44
Table 4.9 Role/importance of the species population in the offset area 44
Table 4.10 Koala densities in each offset assessment unit 45
Table 4.11 Koala utilisation levels based on SAT search results 45
Table 5.1 Cover of target weed species recorded in weed monitoring quadrats in the 2024 monitoring event 54

Table 5.2 Changes in combines densities of target weed species between 2020, 2022 and 2024 56

Figure index

Figure 2.1 Koala offset areas 6
Figure 2.2 Black-breasted button-quail offset area 9
Figure 3.1 Koala survey sites 11
Figure 3.2 Black-breasted button quail sites 14
Figure 3.3 Weed control monitoring sites 15
Figure 3.4 Relationship between offset area group, assessment unit and BioCondition plot 19
Figure 3.5 Layout of the condition plot 21
Figure 4.1 Average BioCondition scores across offset areas relative to maximum possible scores (expressed as percentages) 32
Figure 4.2 Average attribute scores for EDL recruitment, tree canopy height and number of large trees across AUs 34
Figure 4.3 Average attribute scores for native plant species richness across AUs 34
Figure 4.4 Average attribute scores for vegetation cover across AUs 35
Figure 4.5 Average attribute scores for organic litter and coarse woody debris across AUs 35
Figure 4.6 Average attribute scores for non-native plant cover across AUs 36
Figure 4.7 Comparison of relative BioCondition scores for respective attributes over time (2020 – 2024) 37
Figure 4.8 Comparison of relative BioCondition scores for respective attributes over time (2020, 2022 and 2024) 37
Figure 4.9 Distribution of koalas recorded during field surveys in 2024 48
Figure 4.10 Distribution of black-breasted button-quail records in 2024 52
Figure 5.1 Change in combined weed density (2022-24) 58

Appendices

Appendix A Modified QLD Habitat Quality Sheet for Koala
Appendix B Modified QLD Habitat Quality Sheet for Black-breasted button-quail
Appendix C BioCondition Field Data
Appendix D Weed density comparison 2020 vs 2022 vs 2024

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.

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. The Baseline Assessments were completed in 2020, first (Year 1) Biennial Monitoring event completed in 2022, while this report represents the second (Year 3) Biennial Monitoring Report (2024).

Table 1.1 Relevant Conditions under EPBC2017/7941

Condition No.	Condition
Condition 9 (Varied 20/4/2020)	*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 280.36 hectares at the Koala offsets areas and 32.15 hectares at the Black-breasted Button-quail offset area. Within 20 business days of securing the Koala offset areas and Black-breasted Button-quail offset area, and prior to commencement, the approval holder must provide the Department with evidence of the date(s) on which the Koala offset areas and Black-breasted Button-quail offset area were legally secured and electronic spatial data (shapefiles) and offset attributes of the Koala offset areas and Black-breasted Button-quail offset area.*
Condition 12 (Varied 20/4/2020)	*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 11a;* *b. Within 12 months of completing the baseline surveys required by condition 11a for 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 completing the baseline surveys required by condition 11a, demonstrate a 20% increase in Koala food tree recruitment over the entire Koala offset areas compared to the baseline survey results reported as required under condition 11a;* *d. Demonstrate the following reductions in weed infestation in all of the Koala offset areas and the Black-breasted Button-quail offset area compared to the baseline data reported as required under condition 11a:* *i. 50% reduction within 3 years of completing the baseline surveys required by condition 11a;* *ii. 90% reduction within 10 years of completing the baseline surveys required by condition 11a;* *e. Within 15 years of completing the baseline surveys required by condition 11a, demonstrate than an increase of at least 50% of Koala density has been achieved across the entirety of the Koala offset areas compared to the baseline data reported under condition 11a. To determine progress towards this outcome, Koala density surveys must be undertaken across the entirety of the Koala offset areas by a suitably qualified person within both 5 and 10 years respectively of completing the baseline surveys required by condition 11a. Contingency measures must be implemented to increase Koala density*

Condition No.	Condition
	across the entire Koala offset areas where the results of these surveys indicate no or minimal increases in Koala density; *f. Demonstrate a reduction across each of the Koala offset areas and the Black-breasted Button-quail offset area, maintained for at least 10 consecutive years from completion of the baseline surveys required by condition 11a, in pest abundance compared to the baseline data reported under condition 11a;* *g. Report to the Department in each compliance report required under condition 20, matters required under condition 11b, and progress towards and achievement of the outcome milestones specified in this condition 12.*

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 3 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 2024.

Results of the Year 1 biennial monitoring event are detailed in *Bruce Highway (Cooroy to Curra) Section D – Commonwealth Offset Delivery Biennial Monitoring Report – 2022 (GHD 2022).*

1.2 Scope and limitations

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

GHD otherwise disclaims responsibility to any person other than Department of Transport and Main Roads 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.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary.

1.3 Suitably qualified personnel

Condition 10 of the EPBC 2017/7941 approval 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 20 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).

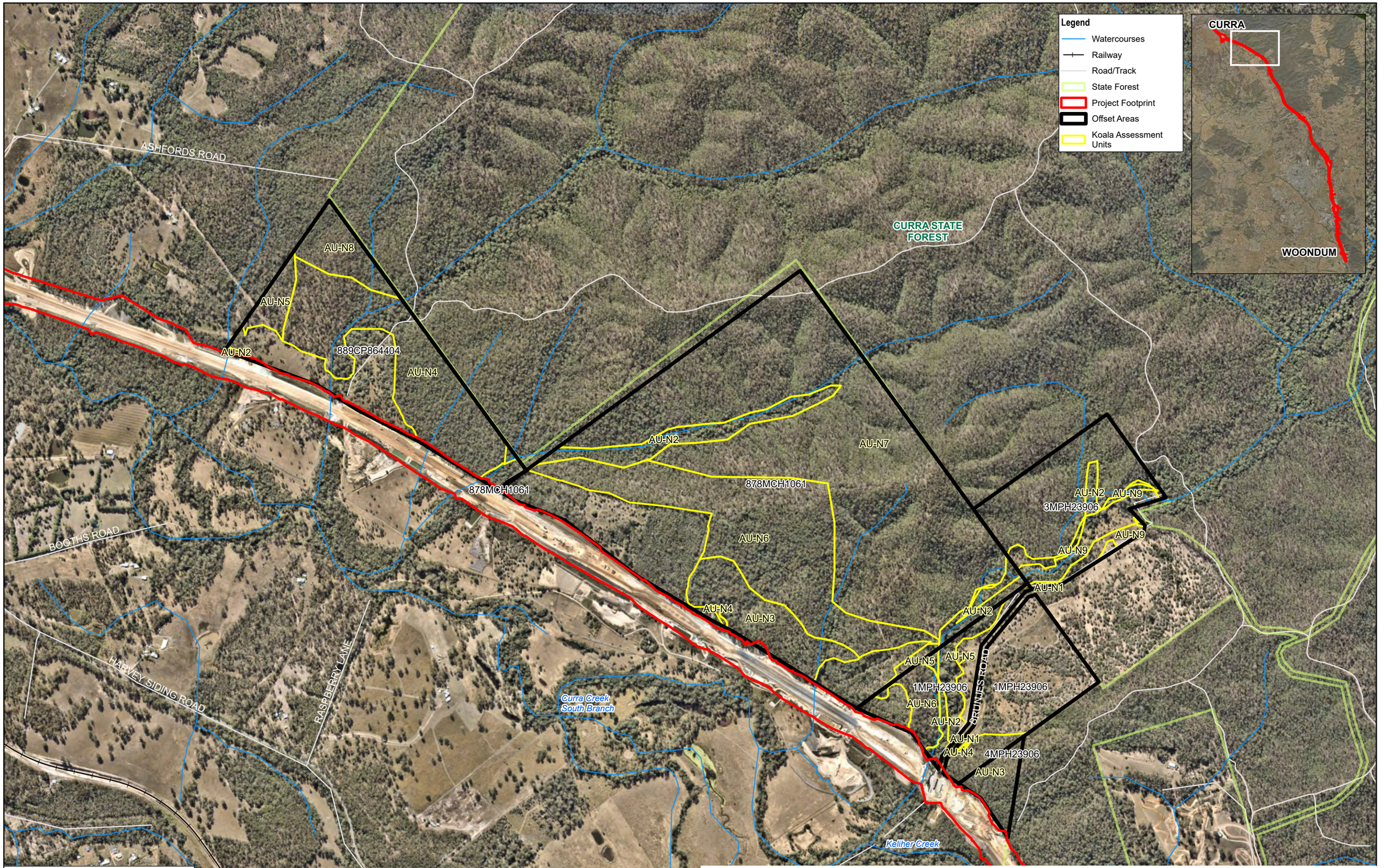
The koala and black-breasted button-quail offset areas are described in Table 2.1 and shown in Figure 2.1 and Figure 2.2, respectively. Individual assessment units (AU's) are detailed for each offset area.

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



Data Disclaimer

© 2024. Whilst every care has been taken to prepare this map, TMR, GHD and DoR make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

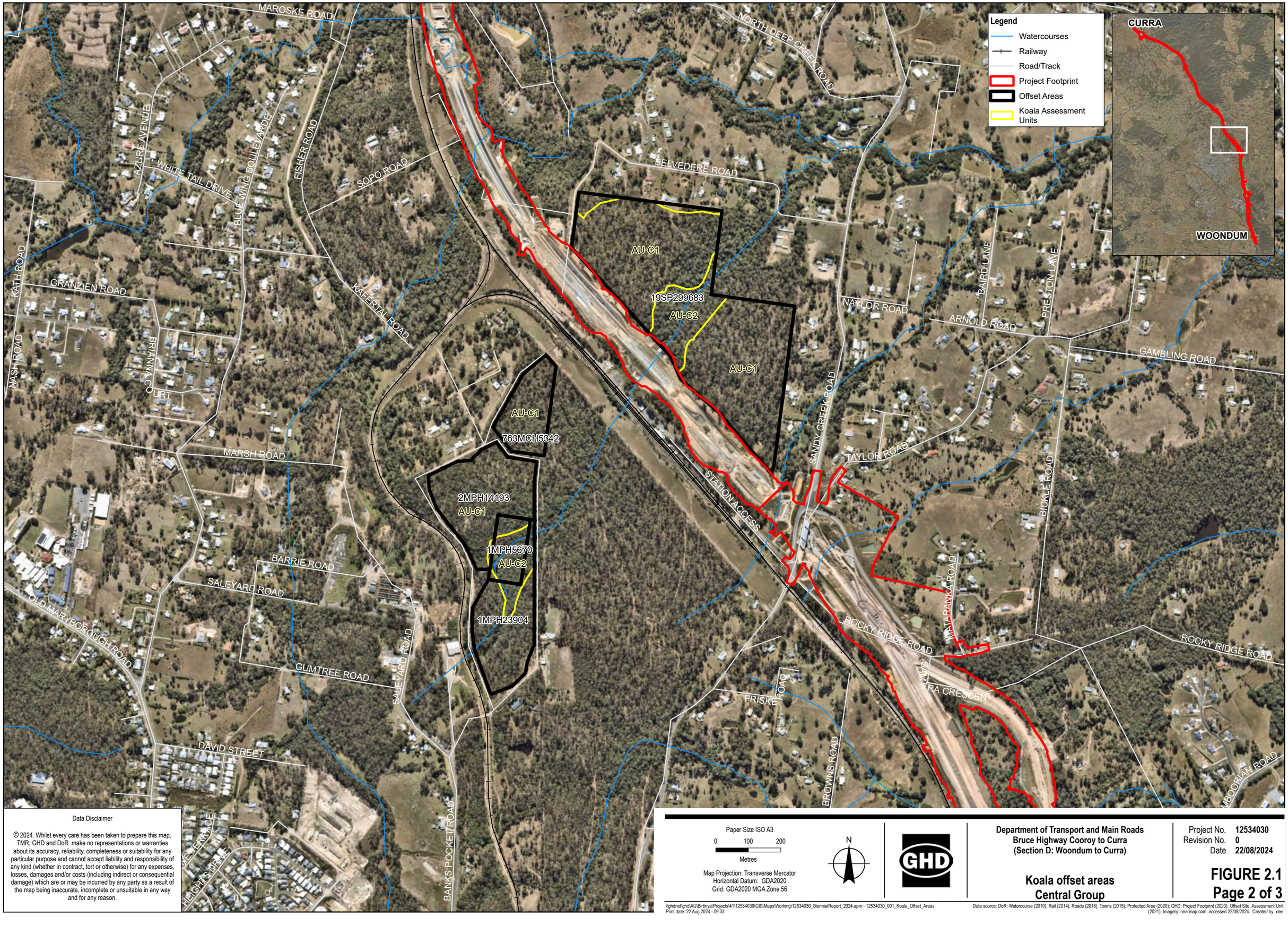
Koala offset areas
Northern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 2.1
Page 1 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_001_Koala_Offset_Areas
Print date: 22 Aug 2024 - 09:33

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Koala offset areas
Central Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 2.1
Page 2 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_001_Koala_Offset_Areas
Print date: 22 Aug 2024 - 09:33

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

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

CURRA
WOOND JM

Six Mile Creek
KEEFTON ROAD
AU-S1
AU-S7
102SP297908
AU-S2
AU-S2
AU-S3
AU-S3
AU-S5
AU-S2
AU-S4
AU-S3
AU-S5
3SP302524
AU-S3
WOONDUM STATE FOREST
AU-S6
AU-S4
2SP302526
AU-S4
AU-S2
AU-S6
Mary River
DAWN ROAD
BRUCE HIGHWAY
Mary River

Data Disclaimer

Paper Size ISO A3
0 100 200
Metres
Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

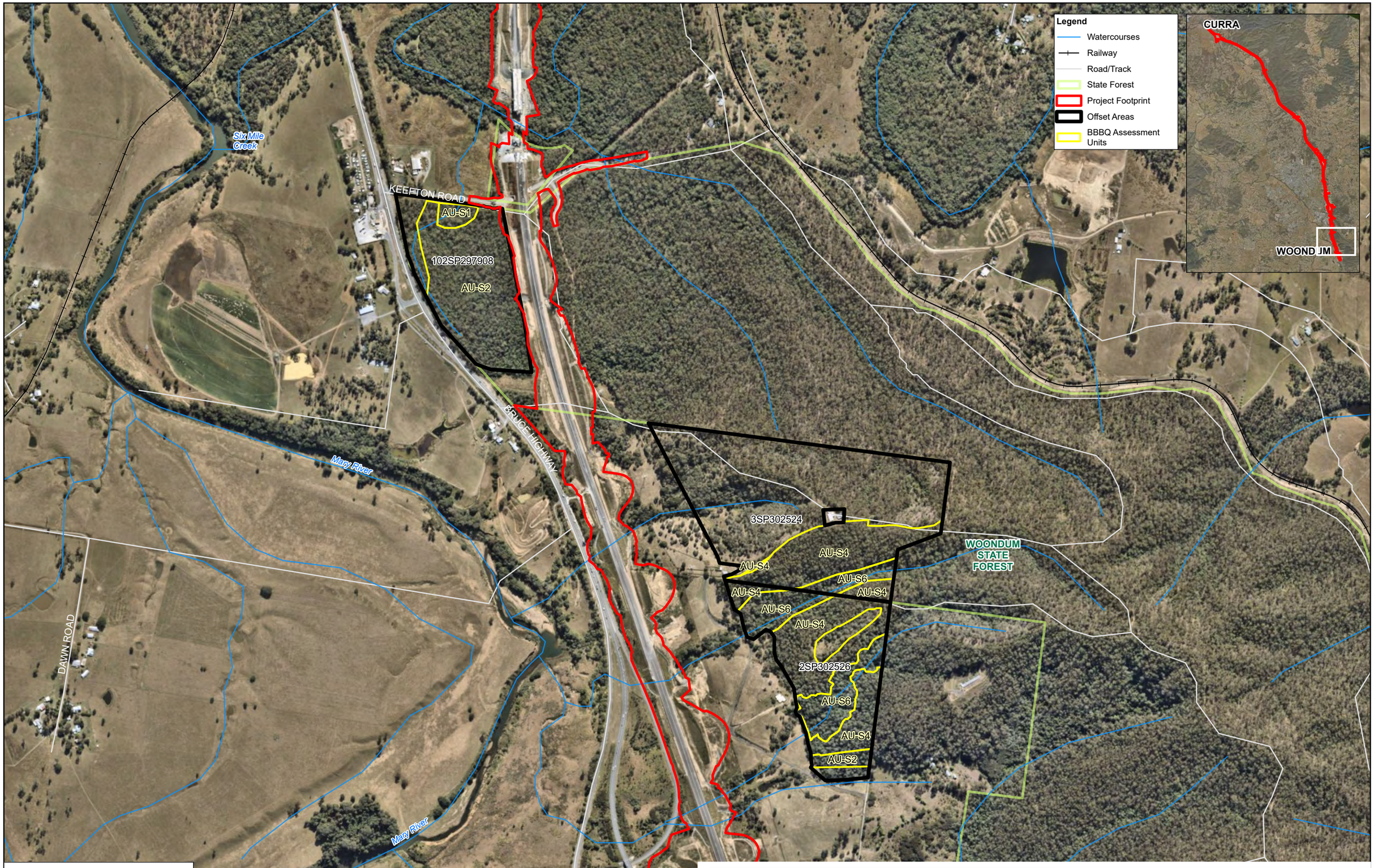
Koala offset areas
Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 2.1
Page 3 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_001_Koala_Offset_Areas
Print date: 22 Aug 2024 - 09:33

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

© 2024. Whilst every care has been taken to prepare this map, TMR, GHD and DoR make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Black-breasted button quail offset areas
Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 2.2

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_002_BBBQ_Offset_Areas
Print date: 22 Aug 2024 - 09:40

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

3. Monitoring methods

3.1 Monitoring survey overview

This represents the second biennial monitoring event, baseline surveys were completed in 2020 with the first round of biennial monitoring completed in 2022 (GHD, 2022). Monitoring was undertaken by three ecologists (Peter Moonie, Simon Hodgkison and Sonya Chamberlain) over two survey events in April 2024. Surveys were undertaken within each offset area to document the following in accordance with Condition 10 of the EPBC Act approval:

– Quality of koala habitat through site condition, site context and species stocking rates
– Weed infestation
– Koala density
– Black-breasted button-quail presence.
– Active management areas including revegetation areas, targeted naturally regenerating areas, weed management areas and land-use access management areas.

Further details on the requirements of each assessment category are provided within the following sections. The surveys undertaken during 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
15 – 20 April 2024	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 8 x remote surveillance cameras
23 – 26 April 2024	Weed surveys

Legend

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

CURRA

WOONDUM

ASHFORDS ROAD

CURRA STATE FOREST

AU-N8

AU-N5

AU-N2

889CP864404

AU-N4

878MCH1061

AU-N2

AU-N7

878MCH1061

AU-N2 AU-N9

3MPH23906

AU-N6

AU-N9

AU-N9

AU-N1

AU-N4

AU-N3

AU-N2

AU-N5 AU-N5

BRUNJES ROAD

1MPH23906 1MPH23906

AU-N6

AU-N2

AU-N1

AU-N4 4MPH23906

AU-N3

BOOTHS ROAD

HARVEY SIDING ROAD

RASPBERRY LANE

Curra Creek South Branch

Kelliher Creek

Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

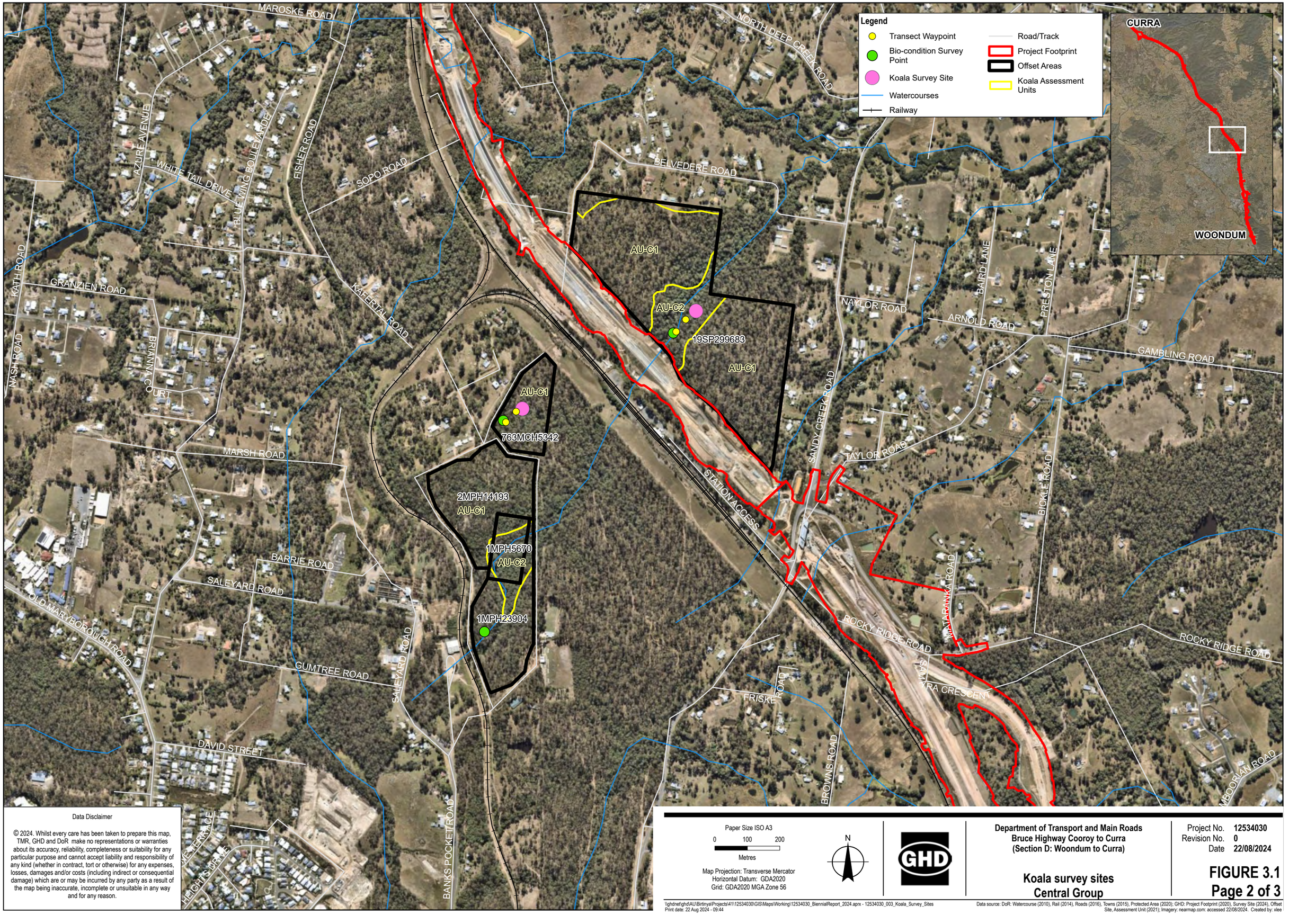
Koala survey sites
Northern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.1
Page 1 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_003_Koala_Survey_Sites
Print date: 22 Aug 2024 - 09:44

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Survey Site (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

© 2024. Whilst every care has been taken to prepare this map, TMR, GHD and DoR make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Koala survey sites
Central Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.1
Page 2 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_003_Koala_Survey_Sites
Print date: 22 Aug 2024 - 09:44

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Survey Site (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

Legend

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

CURRA

WOOND JM

Six Mile Creek

KEEFTON ROAD

AU-S1

102SP297908

AU-S2

AU-S7

AU-S2

AU-S3

AU-S5

AU-S3

AU-S2

AU-S4

AU-S3

AU-S5

AU-S3

3SP302524

WOONDUM STATE FOREST

AU-S6

AU-S4

2SP302526

AU-S4

AU-S2

AU-S6

Mary River

DAWN ROAD

BRUCE HIGHWAY

Mary River

Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Koala survey sites
Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.1
Page 3 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_003_Koala_Survey_Sites
Print date: 22 Aug 2024 - 09:44

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Survey Site (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

Legend

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

CURRA

WOOND JM

Six Mile Creek

KEEFTON ROAD

AU-S1

102SP297908

AU-S2

Mary River

3SP302524

AU-S4

AU-S4

AU-S6

AU-S4

AU-S4

AU-S6

AU-S4

AU-S4

2SP302526

AU-S6

AU-S2

WOONDUM STATE FOREST

DAWN ROAD

BRUCE HIGHWAY

Mary River

Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

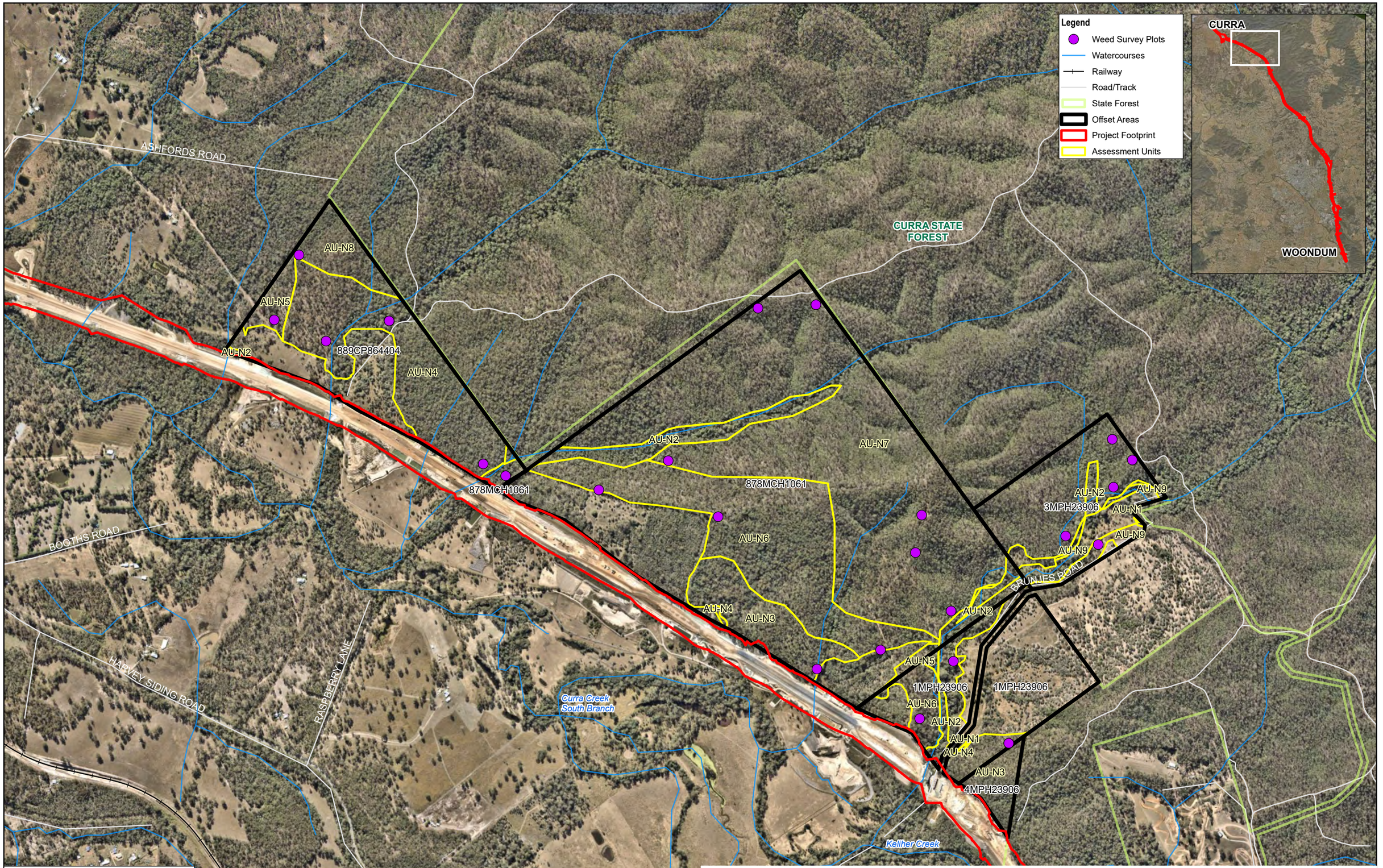
Black-breasted button-quail sites
Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.2

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_004_BBBQ_Survey_Sites
Print date: 22 Aug 2024 - 09:50

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015); GHD: Project Footprint (2020), Survey Site (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

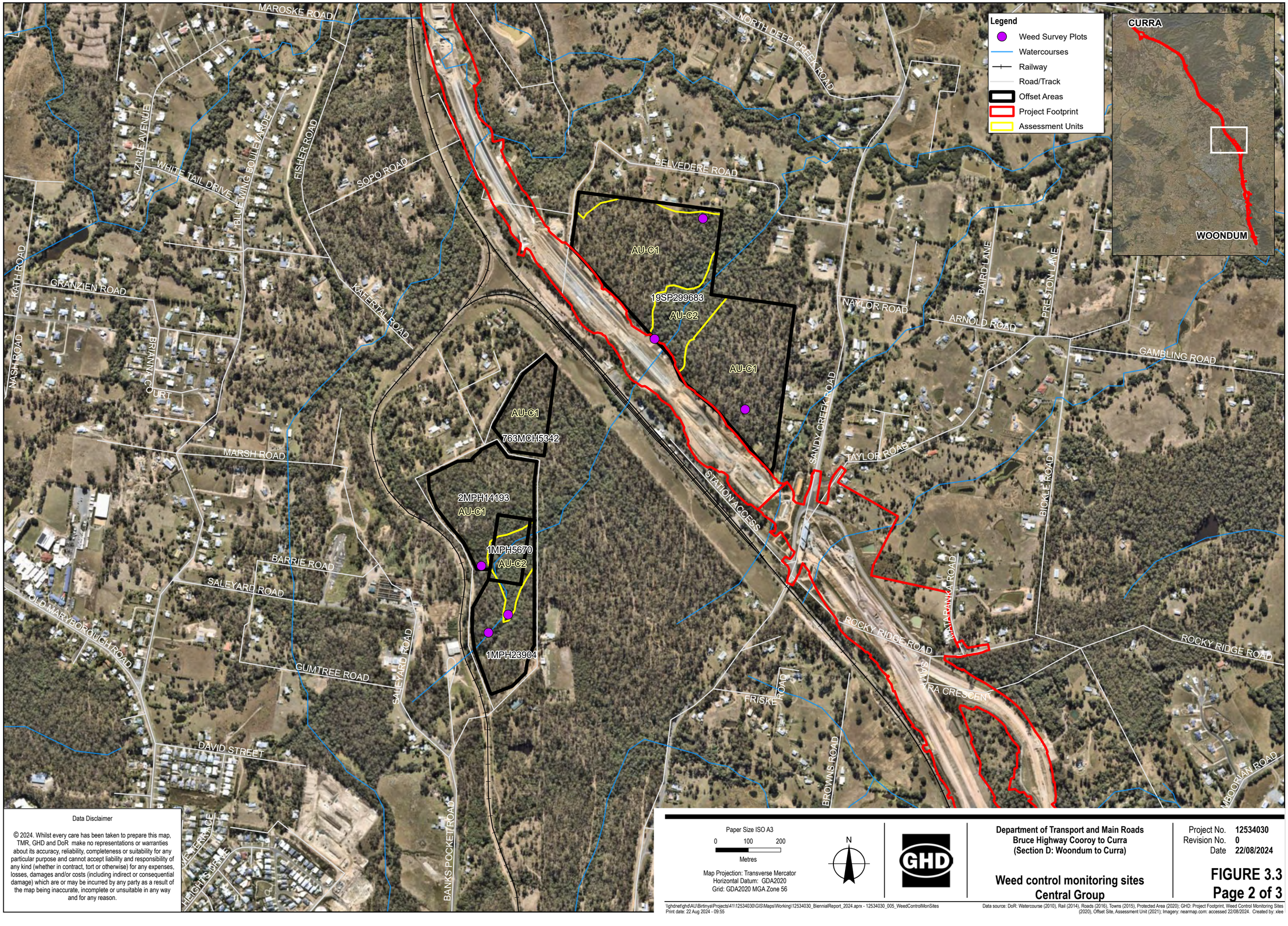
Weed control monitoring sites Northern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.3
Page 1 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_005_WeedControlMonSites
Print date: 22 Aug 2024 - 09:55

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

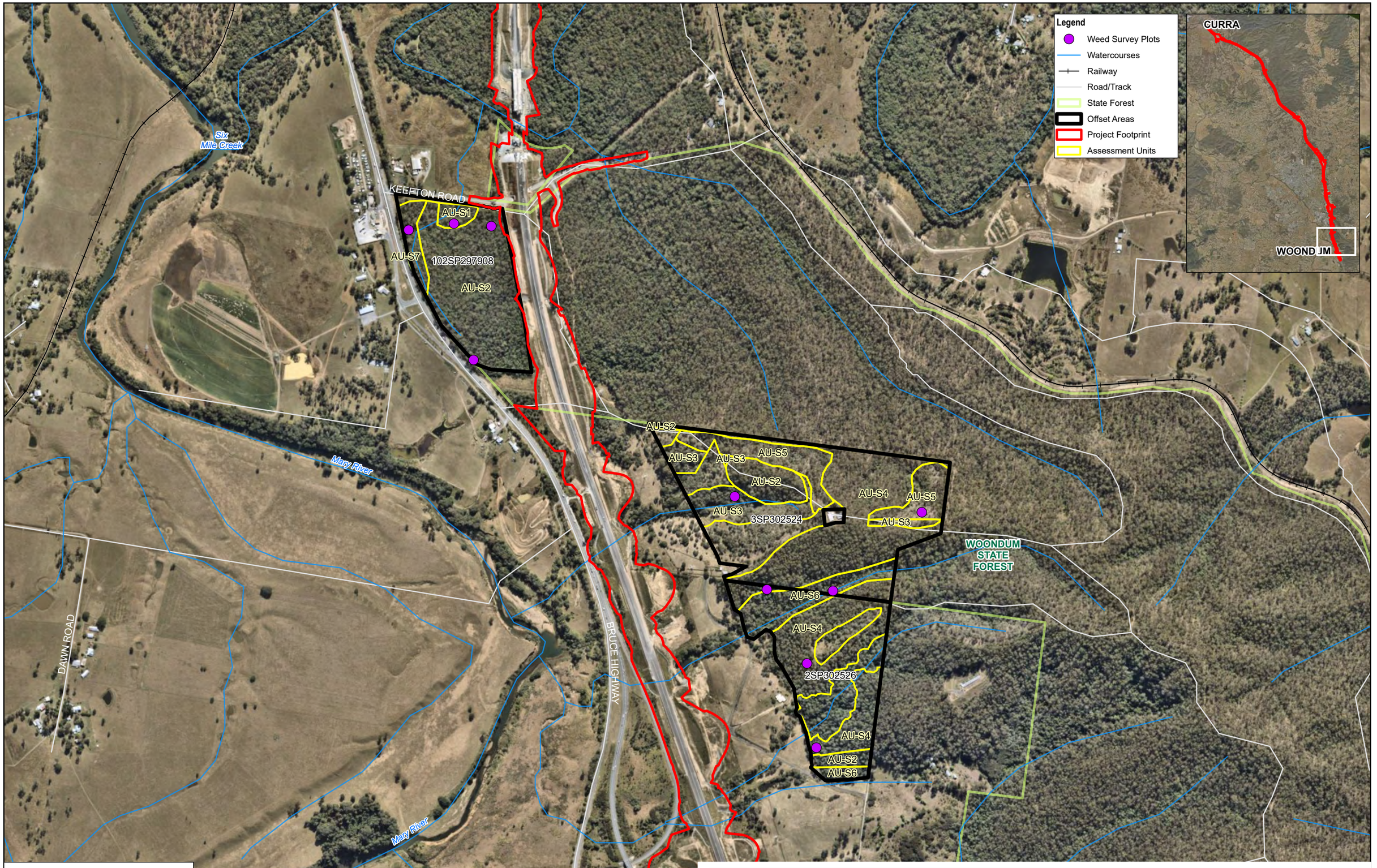
Weed control monitoring sites
Central Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.3
Page 2 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_005_WeedControlMonSites
Print date: 22 Aug 2024 - 09:55

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Weed control monitoring sites
Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 3.3
Page 3 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_005_WeedControlMonSites
Print date: 22 Aug 2024 - 09:56

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites (2020), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

3.2 Weather conditions

Weather conditions during the survey windows were generally typical for Queensland April conditions with temperatures between a maximum of 21.9 – 29.4 °C and minimum temperature ranging from 13.3 -18.9 °C with light rainfall of between 0.2 – 3.4 mm occurring throughout the survey windows (BoM 2024).

Southeast Queensland has received consistent rainfall over the past 6 months, with several heavy rainfall events associated with ex-severe tropical cyclones Jasper and Kirrily occurring in December 2023 and January 2024 respectively. Significant rainfall events have the potential to influence habitat values particularly for the black-breasted button-quail, by removing leaf litter and the potential to reduce 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 may increase the detectability of fresh koala faecal pellets. Consistent rainfall also aids the growth of plants, which has the potential to benefit offset sites by assisting with recruitment and the potential to adversely impact success by encouraging growth of invasive weed species and bringing in weed seeds during overland flows. Heavy rainfall and the resulting localised flooding also adversely impact the accessibility of sites during schedule habitat restoration and weed control programs. Evidence of localised flooding (i.e. flood debris) was observed at four weed monitoring plots (S7-1, S1-1, N1-1, and C2-2).

Whilst weather has the potential to both positively and negatively influence the success of offsets, other factors such as aspect of site, existing soil nutrients, competition, species composition, seed bank reserve etc may also influencing the success rates. Therefore, over the short term, no strong correlations of how weather directly impacts offset success can be concluded due to the dynamic nature of the ecosystem.

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) was 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.

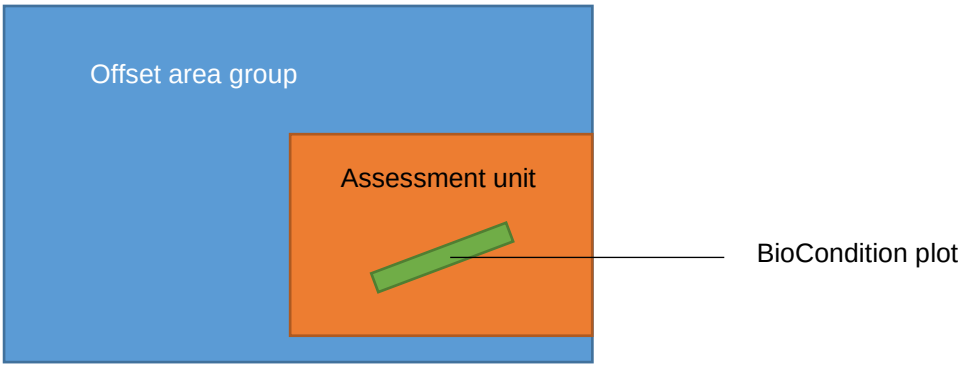


Figure 3.4 Relationship between offset area group, assessment unit and BioCondition plot

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 were established in 2020 during the baseline surveys and were revisited in 2022 and again during the 2024 monitoring event. Each plot measures 100 m by 50 m. Plots were easily relocated as steel pickets/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).

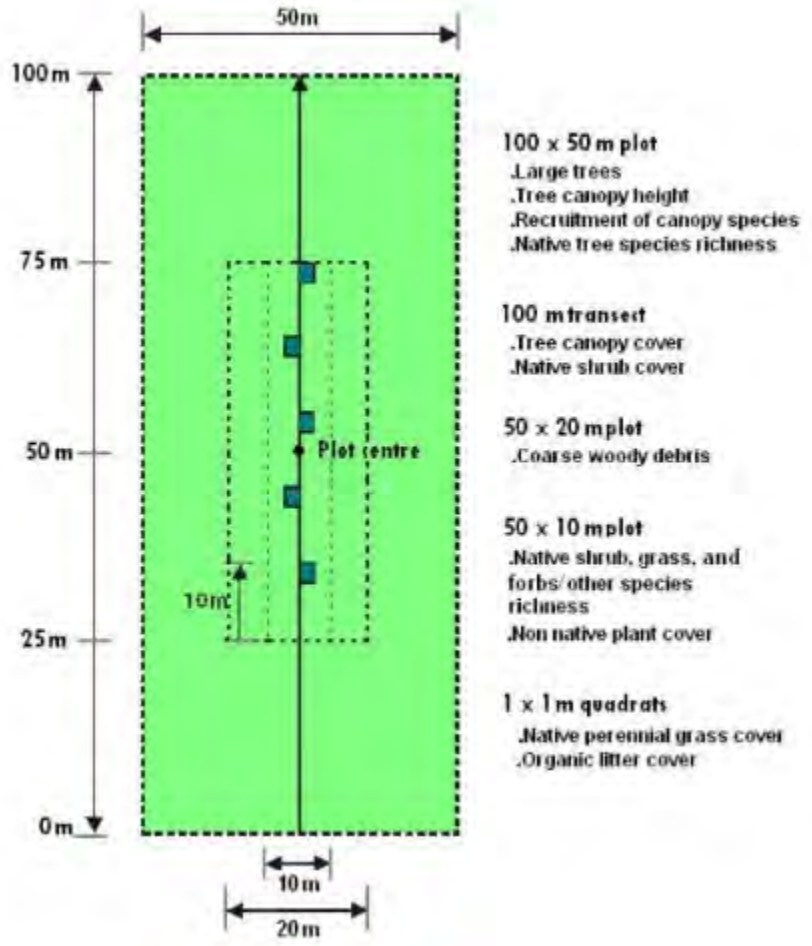


Figure 3.5 Layout of the condition plot

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 from 2022 (Year 1) 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.

As drone surveys are not required during the Year 3 (2024) monitoring event, drone survey data from the Year 1 monitoring event will be utilised assuming no change has occurred to provide an indicative idea of density. Updated local koala utilisation from the SAT method will be incorporated into the 2024 (Year 3) approximate density.

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 two 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 faecal pellet searches, deployment of remote surveillance cameras (within southern AUs), 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) was 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

As per EPBC 2017/7941 Condition 12.e '…*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*…' (refer to Table 1.1 for full condition details).

Therefore, although drone surveys for koala density was undertaken and reported on in the Baseline and Biennial Monitoring Report -2022, this survey method was not utilised during the 2024 biennial monitoring. The next round of koala density drone surveys will be undertaken in Year 5 (2026) from legally securing the koala offset area, therefore occurring in 2026 and be reported on within the Biennial Monitoring Report - 2026.

Consequently, koala utilisation for this report is reliant on SAT surveys and remote sensor cameras and may not provide a true indication of koala densities across the offset areas. In absence of updated drone koala density results, the results from the Year 1 Biennial Monitoring Report (GHD, 2022) will be used assuming no change has occurred to provide a suitable comparison.

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 April 2024 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 April 2024, 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.

3.4.4 Black-breasted button-quail presence

To comply with the EPBC Act approval conditions, targeted surveys were undertaken over two 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 areas 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 two 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 7 cameras were set at locations mapped in Figure 3.2. Cameras were set on 19 April 2024 and collected 15 May 2024 (26 days x 8 camera totalling 208 camera days).
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 black-breasted button-quail 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.
Targeted habitat assessment	The nature and composition of vegetation was documented at canopy, shrub and ground levels. The following key habitat criteria for the black-breasted button-quail 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 ArcGIS Fieldmap 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 (Baseline Survey Event) 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. C2-1 was monitoring in 2024 and compared against 2022 data as a baseline.

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
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 ArcGIS Fieldmap and included where relevant on management maps included in this report.

4. Monitoring results

4.1 Habitat quality

BioCondition plots and fauna species habitat index assessments were undertaken at the BioCondition sites shown on 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 A and 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 in Appendix C with scores derived from field data shown in the Modified QLD Habitat Quality spreadsheets at Appendix A and Appendix B. A summary of total average scores and ranges recorded across the offset area for each attribute for the 2024 biennial monitoring event is provided in Table 4.1.

4.1.1.1 AU scores

Total average attribute scores for respective AUs ranged from 24.5 to 64.5 out of a possible 80. This suggests that all AUs have capacity for improvement (Table 4.1). As in 2022, all but two AUs had total scores of 40 or greater. AUs N-1 and N-9 recorded the lowest total average scores of 24.5 and 30 respectively; both AUs were field-verified as comprising regrowth vegetation with a largely absent tree layer.

Data for AU 6 is collected separately by WSP for the joint purpose of Threatened Ecological Community monitoring and inclusion within this reporting. WSP monitoring site ‘WBC1’ is used as AS6-1 for the purpose of this report.

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), this result is consistent with observation recorded in 2022. 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.

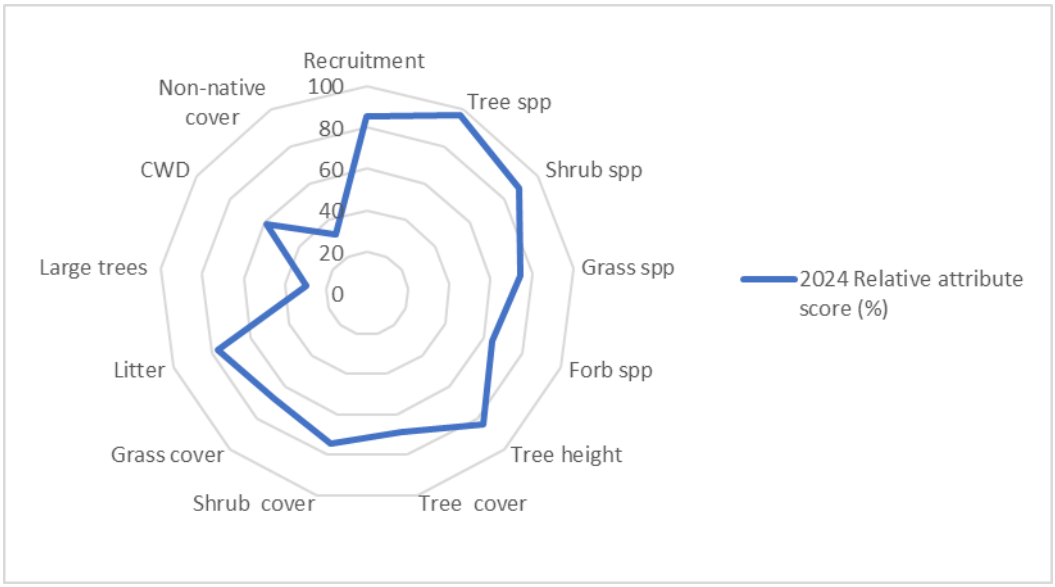


Figure 4.1 Average BioCondition scores across offset areas relative to maximum possible scores (expressed as percentages)

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	5	4.3	5	5	4	3	0	3	5	4.3	5	5	3	5	0-5	4.27 (80.27)
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 (199.58)
Native shrub spp richness	2.5	5	5	5	5	5	4.2	5	5	3.8	5	5	5	2.5	5	5	2.5	5	5	2.5-5	4.44 (138.7)
Native grass spp richness	2.5	2.5	5	5	5	5	4.2	5	2.5	3.8	2.5	2.5	5	5	2.5	5	0	5	5	0-5	3.71 (110.92)
Native forb spp richness	2.5	2.5	5	5	5	3.8	5	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	3.21 (75.59)
Tree height	0	5	4	5	4	4	5	5	1.5	5	5	5	5	5	5	5	3.3	5	5	0-5	4.22 (87.61)
Tree cover	1	4	3.8	5	3.5	4.5	3	1.5	0	4.5	4	4	4	4	4	4	3.3	4	5	0-5	3.42 (172.05)
Shrub cover	0	3	5	3	3	3	5	3	3	5	5	5	4	3	5	5	3	5	5	0-5	3.71 (59.67)
Grass cover	3	5	3	4	5	1	3.7	1	5	5	5	5	5	5	1	1	0	5	5	1-5	3.39 (111.64)
Litter	3	0	4	4	3	5	4.3	5	3	3	5	5	3	3	5	5	5	5	5	0-5	3.84 (56.51)
Large trees	0	5	5	5	0	5	5	5	0	5	5	5	5	5	5	5	10	5	15	0-10	4.41 (15.12)
Coarse woody debris	0	2	5	3.5	5	2	5	0	0	5	2	2	3.5	5	3	5	2	5	5	0-5	2.94 (100.01)
Non-native cover	0	0	1.5	4	5	10	5	3	2	10	0	7.5	3	5	4	3	5	10	10	0-10	3.24 (32.92)
TOTAL SCORE	**24.5**	**44.0**	**55.3**	**58.5**	**53.5**	**51.3**	**55.7**	**53.0**	**30.0**	**59.1**	**52.0**	**51.0**	**54.0**	**53.0**	**50.1**	**52.5**	**46.6**	**64.5**	**80**	**24.5-64.5**	**49.65 (62.06)**

*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 three AUs recording nil scores and two AUs 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 shrub species richness, where scores generally varied by no more than 2.5 points.

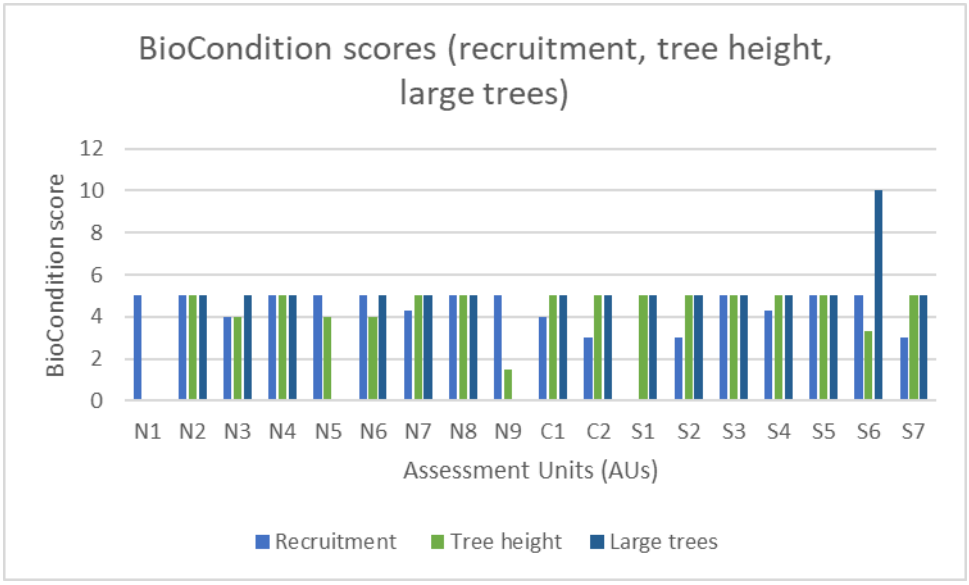


Figure 4.2 ***Average attribute scores for EDL recruitment, tree canopy height and number of large trees across AUs***

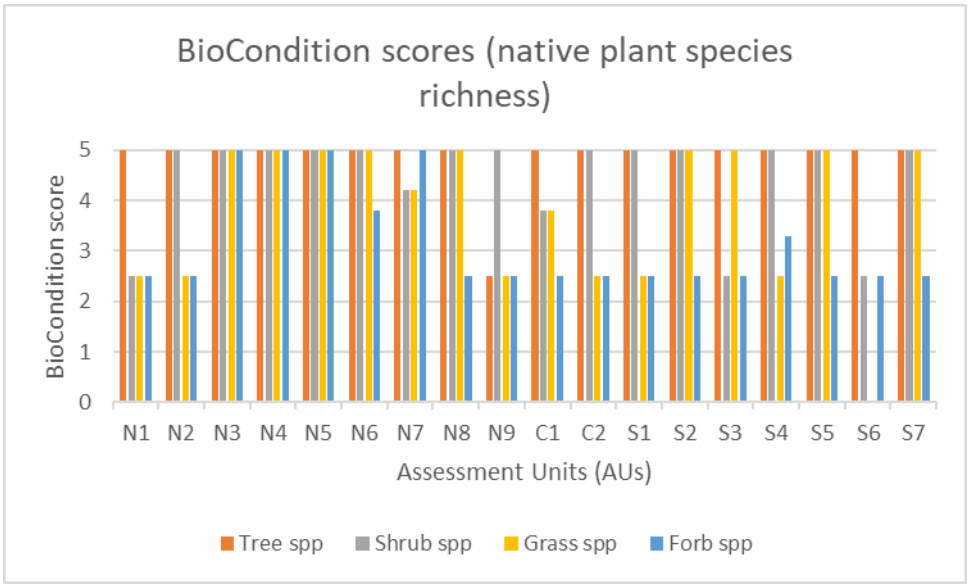


Figure 4.3 ***Average attribute scores for native plant species richness across AUs***

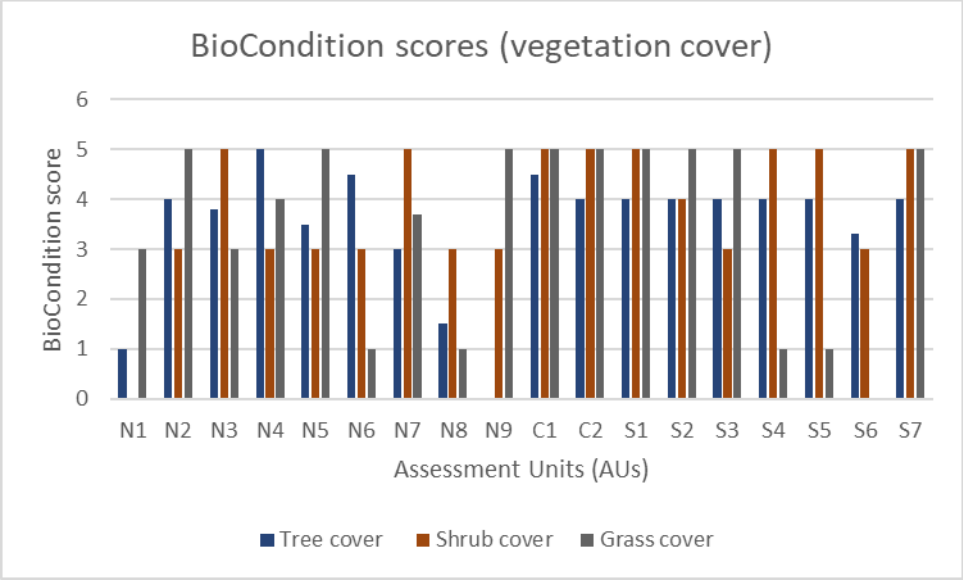


Figure 4.4 Average attribute scores for vegetation cover across AUs

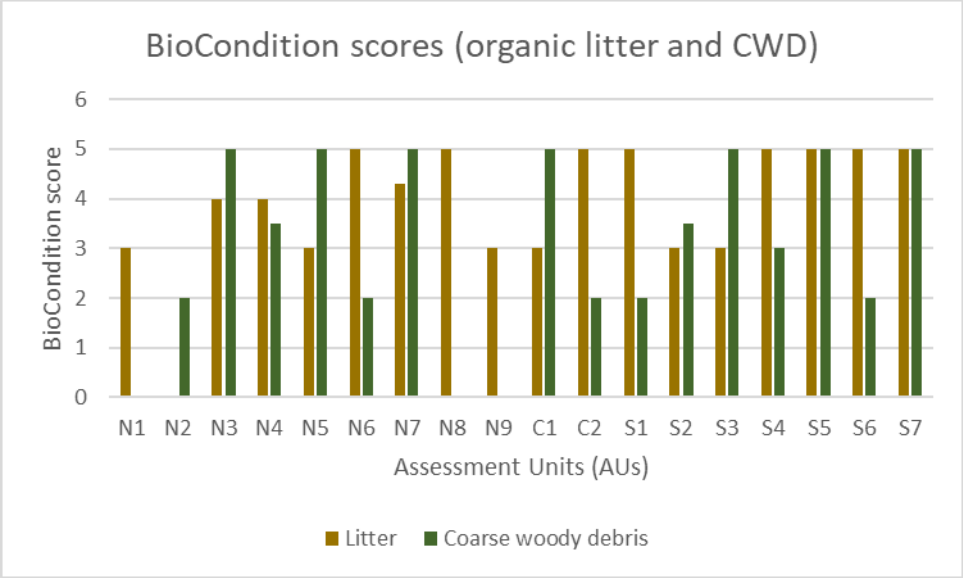


Figure 4.5 Average attribute scores for organic litter and coarse woody debris across AUs

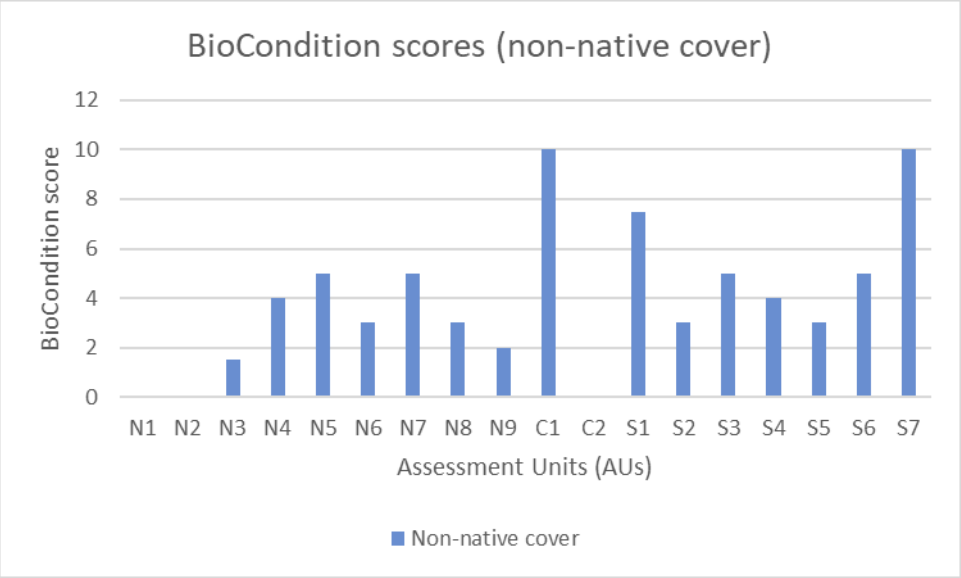


Figure 4.6 Average attribute scores for non-native plant cover across AUs

4.1.1.3 Baseline data comparison

The overall total BioCondition score[1] increased from 43.9 (out of a possible 80) in 2020 to 49.65 in 2024. In 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 7.2% when comparing relative scores[3] from the 2020 (Baseline) and 2024 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 46.6% and 26.5% respectively (noting that a higher relative score for non-native plant cover reflects 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 three 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. Preliminary trends in data are shown in Figure 4.8.

Table 4.2 Changes in average relative scores across AUs between 2020, 2022, and 2024

Attribute	2020 Total average score (relative score [3])	2022 Total average score (relative score [3])	2024 Total average score (relative score [3])	Change from 2020 to 2024 (percentage points)
Recruitment	79.0	82.2	85.4	6.4
Tree spp	95.2	97.0	97	1.8
Shrub spp	82.2	72.6	88.8	6.6
Grass spp	67.0	79.4	74.2	7.2
Forb spp	58.8	57.4	64.2	5.4
Tree height	83.8	86.6	84.4	0.6
Tree cover	69.8	68.4	68.4	-1.4
Shrub cover	61.0	67.4	74.2	13.2
Grass cover	21.2	51.4	67.8	46.6

[1] Overall total BioCondition Score – average of the total BioCondition scores calculated for each AU
[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])	2024 Total average score (relative score [3])	Change from 2020 to 2024 (percentage points)
Litter	100.0	84.8	76.8	-23.2
Large trees	27.5	34.3	29.4	1.9
CWD	65.8	65.8	58.8	-7.0
Non-native cover	5.9	33.8	32.4	26.5

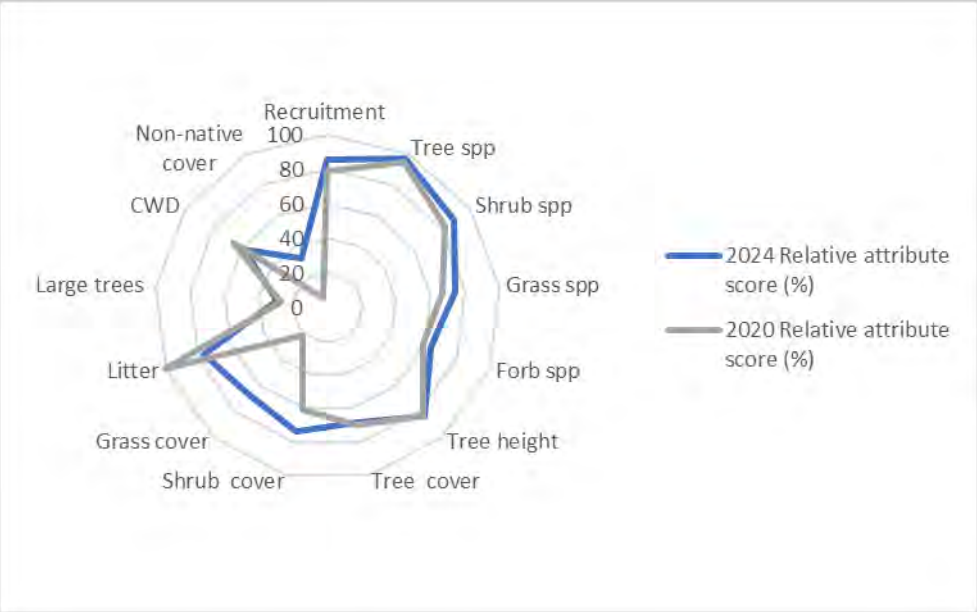


Figure 4.7 Comparison of relative BioCondition scores for respective attributes over time (2020 – 2024)

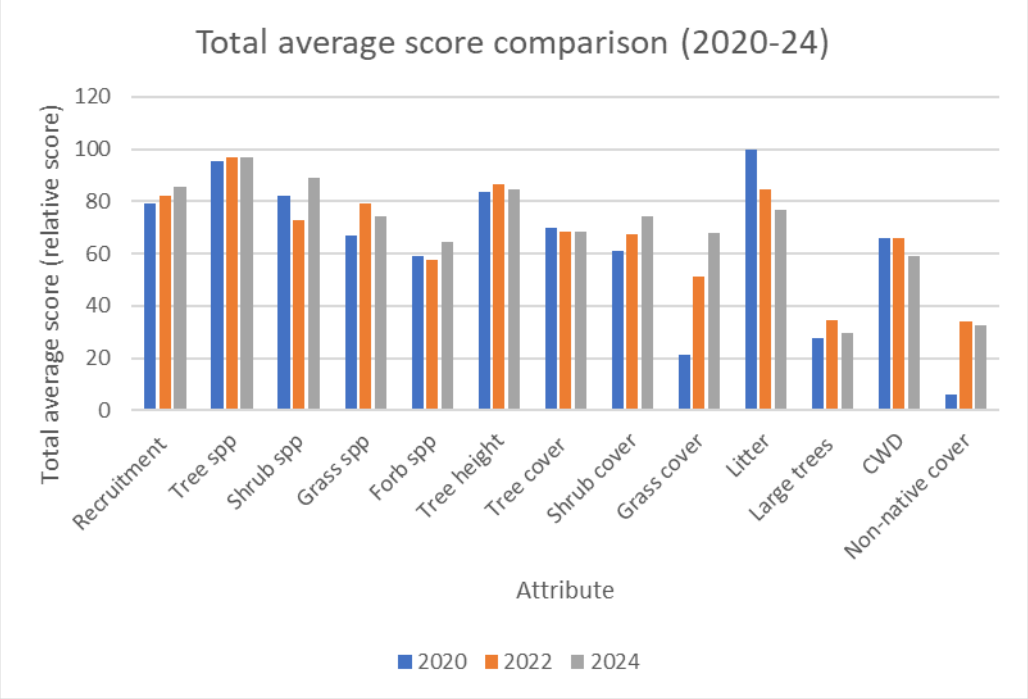


Figure 4.8 Comparison of relative BioCondition scores for respective attributes over time (2020, 2022 and 2024)

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
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

Assessment unit	Connectedness	Score
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

Assessment unit	Context	Score
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 improved slightly since the 2020 and 2022 monitoring events. Scores ranged between 0.3 and 9.2, with a slight increase in the average score of 4.93 (from 4.17 in 2020 and 4.2 in 2022). The increase has been largely attributed to ongoing active weed management, with the removal of *Lantana camara* in many plots increasing the ease of movement, contributing to improved foraging habitat scores. Small increases in food tree species richness, achieved in planted sites (N1-1 and N9-1), also contributed to increased foraging habitat scores in these plots.

4.1.3.2 Quality of shelter

Scores out of 10 for the quality of shelter for koalas were broadly consistent with those recorded in 2022, both increasing slightly from the baseline monitoring event in 2020. Current shelter scores ranged between 0.83 and 8.5, with an average of 5.5 (compared with 5.5 in 2022 and 4.7 in 2020). As identified in 2020, most sites have moderate to high shelter scores, with a small number of relatively cleared sites (i.e. N1-1, N9-1), accounting for very low shelter scores. Growth of vegetation in those AUs will account for the majority of improvements in habitat value over time. Condition sites with higher scores for koala shelter (i.e. S1-1 and S4-1) had high levels of vegetation in the shrub and sub-canopy layers, as shown in Plate 4.1.

Plate 4.1 High koala shelter habitat values in plot S1-1 (left) and S4-1 (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 adjacent to the northern AUs. 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 by domestic dogs, thereby reducing the localised threat of dog attacks. This reduction was only likely in the northern AUs, as the central and southern AUs are still in close proximity to rural residential housing. Combined threat scores for the northern AUs declined, due to the reduction in dog attacks, with the threat of vehicle collision remaining low. Overall threat scores ranged between 5 and 10, with an average threat score was 8.15, consistent with the 2022 score of 8.09, but higher than the baseline absence of threat score of 6.04 recorded in 2020. The change has come from a reduction in the threat from dog attack. indicating a low level of threat to koalas. The erection of fauna exclusion fencing added

along the project alignment has reduced the threat from dog attack by isolating habitat to an extent from adjacent rural residential areas.

4.1.3.4 Species mobility

Scores out of 10 for koala mobility ranged between 4 and 10, with an average score of 7.57, slightly higher than the 2022 average mobility score of 6.01 and the baseline of 6.14 in 2020. In the first two monitoring events, high densities of *Lantana camara* were responsible for low mobility scores across many AUs. The increase in mobility is attributed to weed management which has reduced lantana densities substantially at a number of plots. Four sites in Woondum State Forest (S1-1, S2-1, S2-2 and S7-1) are likely to have experienced reduced mobility, due to the spatial isolation imposed by the project and the erection of fauna exclusion fencing. While fauna passage has been provided beneath the project alignment (Plate 4.2), the reduction in connectivity would tend to reduce the frequency of koala movement to and from the offset area.

Plate 4.2 Koala crossing beneath the project

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. 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 3.5 and 4.75 with an average score of 4.24, slightly lower than the baseline average score of 4.48 in 2020. The reduction in foraging habitat value was again attributed to a reduction in leaf litter depth and cover, due to increased overland flows/flooding evidence at lower-lying sites particularly AU S1-1 and AU S2-1. The removal of *Lantana camara* has also allowed the proliferation of native carpet grass that has covered leaf litter reducing leaf litter cover and depth in some areas, as shown in Plate 4.3.

Plate 4.3 Carpet grass growing at AU S1-1 reducing leaf litter cover and depth

4.1.4.2 Quality of shelter

Scores out of 10 for the quality of shelter for black-breasted button-quails ranged between 4.4 and 7.4 with an average score of 5.67, higher than the baseline average of 4.36 in 2020 and slightly higher than the 2022 score of 5.15. The slight increase may be attributed to slight increases in native vegetation cover in the shrub layer, particularly in plots where lantana has been actively managed. Sites with high shelter scores including S2-1, S2-2 and S4-1 had high levels of vegetation in the shrub and sub-canopy layers, as shown in Plate 4.4.

Plate 4.4 Sites with dense cover, S2-1 (left) and S4-1 (right)

4.1.4.3 Threats to species

There was a slight increase in the level of threat to the local black-breasted button-quail population from wild cats. Offset areas generally had relatively moderate-high existing threats, ranging from 2.5 to 5 with an average absence of threat score of 3.42. This average score was slightly lower than the 2022 score of 3.57, but comparable to the baseline score of 3.25 out of 10 (where 10 is a low-threat site). As in past events, 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. The removal of lantana from some sites, although positive for the long-term health of the black-breasted button-quail would tend to increase susceptibility to predation by feral cats in the short-term. Threats from vehicle movements were generally considered low.

4.1.4.4 Species mobility

Species mobility scores remain unchanged since the baseline in 2020. 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 for the black-breasted button-quail. Scores out of 10 for species mobility ranged between 4 and 6, with an average score of 4.71. Sites with high levels of localised connectivity, afforded by consistent shrub and sub-canopy cover (AU S2-2 and AU S4-1) had high mobility scores, providing increased opportunities for localised movement.

Plate 4.5 Sites with high cover, S2-1 (left) and S4-1 (right) promoting increased mobility for black-breasted button-quail

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

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

– Koala offset areas scored 6.32 (slightly higher than the 2022 score of 6.12 and the baseline score of 6.07)
– Black-breasted button-quail offset areas scored 6.68, (slightly lower than the 2022 score of 6.75 and 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

As detailed in Section 3.4.3, drone surveys are not required during Year 3 biennial monitoring, and therefore in the absence of updated density data, the 2022 koala density data will be utilised for species stocking rate assuming no change has occurred. Updated drone survey results will be available for the Year 5 biennial monitoring and will provide a better indication of progress towards target koala densities as per Condition 12. A brief summary of drone survey densities from the 2020 baseline compared to the most recent drone survey in 2022 are provided below.

In 2022, the USC thermal drone surveys detected nine koalas in bushland within and immediately adjacent to the offset areas. 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 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 nine out of the 26 AUs. This result was less than the number of sites (i.e. 11 sites) at which koalas were detected during the baseline surveys in 2020 but slightly higher than the seven sites at which koalas were recorded in Year 1 biennial monitoring in 2022. Of the ten sites at which koalas were detected, scats were observed at four (N4-1, N5-1, S2-1 and S3-1), with recent confirmed koala scratches at the remaining six sites.

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, representative evidence of koalas are shown in Plate 4-8 and Plate 4-9. The location of recorded evidence of koalas recorded in 2024 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	2024 SAT results	Proportion	2024 utilisation level
AU N1-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU N2-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent

Assessment unit	Baseline SAT results (2020)	Proportion	Baseline utilisation level (2020)	2022 SAT results	Proportion	2022 utilisation level	2024 SAT results	Proportion	2024 utilisation level
AU N3-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU N3-2	0/30	0%	Absent	0/30	0%	Absent	1/30	3.3%	Low
AU N4-1	1/30	3.3%	Low	0/30	0%	Absent	2/30	6.7%	Low
AU N5-1	1/30	3.3%	Low	0/30	0%	Absent	1/30	3.3%	Low
AU N8-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU N6-1a	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU N6-2	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU N7-1	2/30	6.7%	Low	0/30	0%	Absent	0/30	0%	Absent
AU N7-2a	0/30	0%	Absent	1/30	3.3%	Low	0/30	0%	Absent
AU N7-3	1/30	3.3%	Low	0/30	0%	Absent	0/30	0%	Absent
AUN 9-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU C1-1	1/30	3.3%	Low	0/30	0%	Absent	1/30	3.3%	Low
AU-C2-1	0/30	0%	Absent	4/30	13.3%	Low	2/30	6.7%	Low
AU C1-2	2/30	6.7%	Low	1/30	3.3%	Low	0/30	0%	Absent
AU S1-1	7/30	23.3%	Medium	1/30	3.3%	Low	0/30	0%	Absent
AU S2-1	5/30	16.7%	Low	4/30	13.3%	Low	4/30	13.3%	Low
AU S2-2	7/30	23.3%	Medium	0/30	0%	Absent	0/30	0%	Absent
AU-S3-1	0/30	0%	Absent	1/30	3.3%	Low	4/30	13.3%	Low
AU S4-1	0/30	0%	Absent	0/30	0%	Absent	0/30	0%	Absent
AU S4-2	1/30	3.3%	Low	1/30	3.3%	Low	4/30	13.3%	Low
AU S4-3	0/30	0%	Absent	0/30	0%	Absent	1/30	3.3%	Low
AU S5-1	0/30	0%	Absent	0/30	0%	Absent	1/30	3.3%	Low
AU S7-1	2/30	6.7%	Low	0/30	0%	Absent	0/30	0%	Absent

Plate 4.6 Koala scats recorded in SAT searches within the offset area in 2024

Plate 4.7 Koala scratches recorded in SAT searches within the offset area in 2024

Legend

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

CURRA

WOONDUM

ASHFORDS ROAD

CURRA STATE FOREST

AU-N8

AU-N5

AU-N2

889CP864404

AU-N4

AU-N2

AU-N7

878MCH1061

878MCH1061

AU-N6

AU-N2

AU-N9

3MPH23906

AU-N9

AU-N9

AU-N1

AU-N4

AU-N3

AU-N2

AU-N5

AU-N5

1MPH23906

1MPH23906

AU-N6

AU-N2

AU-N1

AU-N4

4MPH23906

AU-N3

BOOTHS ROAD

HARVEY SIDING ROAD

RASPBERRY LANE

GRUNJES ROAD

Curra Creek South Branch

Kellher Creek

Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

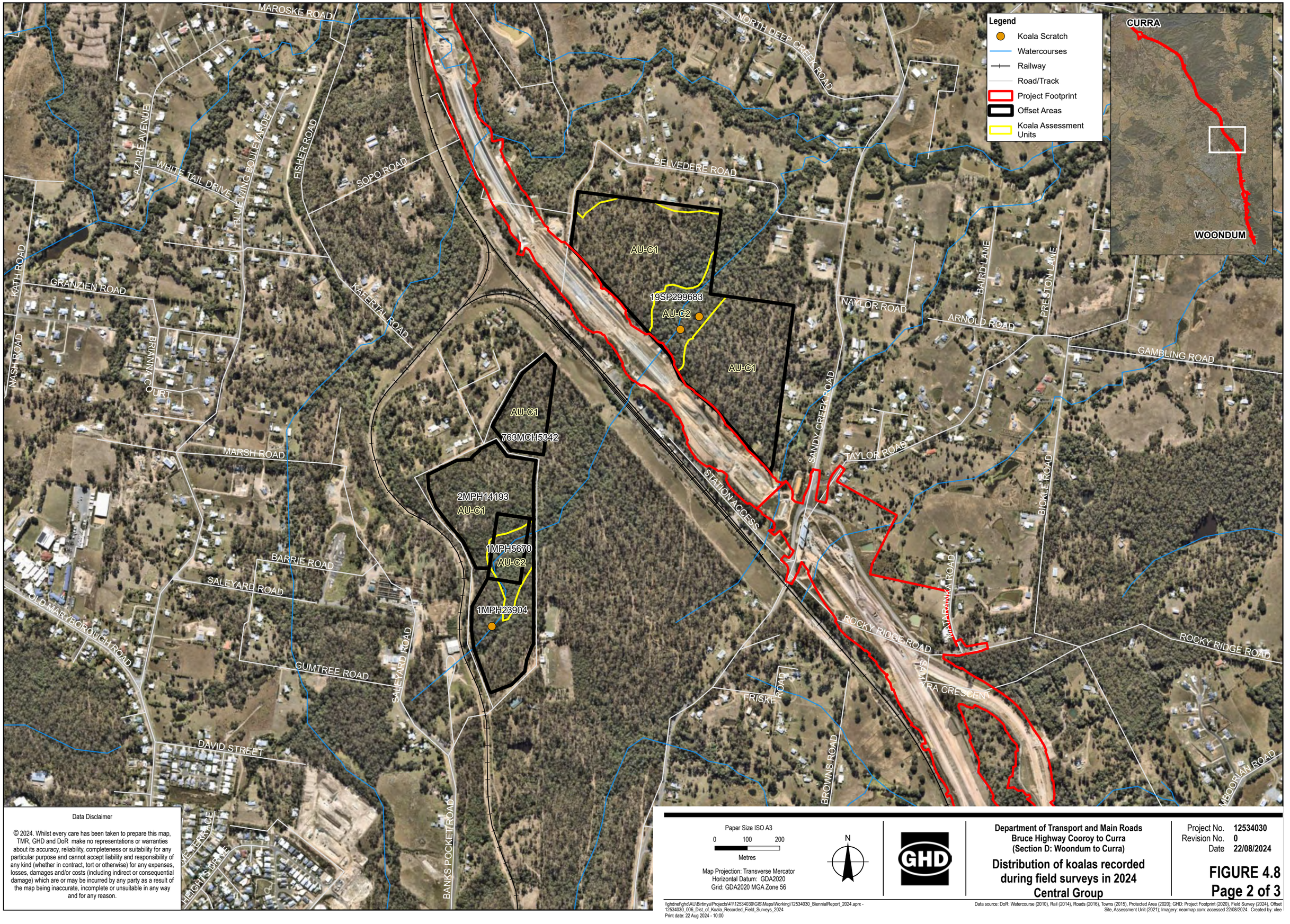
Distribution of koalas recorded during field surveys in 2024 Northern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 4.8
Page 1 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_006_Dist_of_Koala_Recorded_Field_Surveys_2024
Print date: 22 Aug 2024 - 10:00

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Field Survey (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

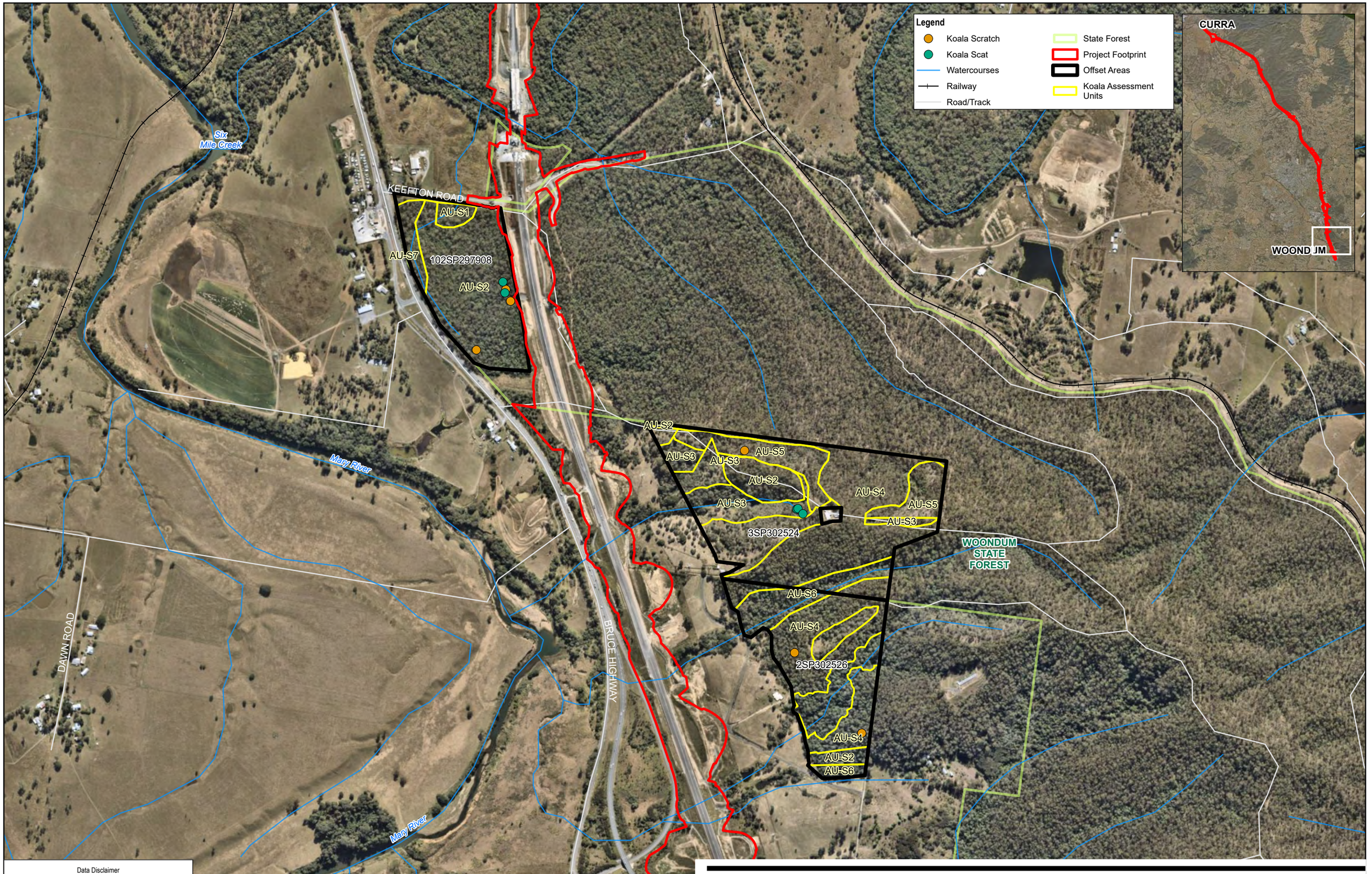
Distribution of koalas recorded during field surveys in 2024 Central Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 4.8 Page 2 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_006_Dist_of_Koala_Recorded_Field_Surveys_2024
Print date: 22 Aug 2024 - 10:00

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Field Survey (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Distribution of koalas recorded during field surveys in 2024 Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 4.8 Page 3 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_006_Dist_of_Koala_Recorded_Field_Surveys_2024
Print date: 22 Aug 2024 - 10:01

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Field Survey (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

4.3 Black-breasted button-quail presence

The black-breasted button-quail was confirmed present across the three southern offset areas. These were located in assessment units AU S2-1, AU S2-2 and AU S4-1 across four locations (Figure 4-9). The species was positively identified from characteristic scats (Plate 4.8) observed adjacent to platelets (Plate 4.9) in four 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 S4-1, which was the only plot were sheet erosion wasn't observed during following the flood event of 2022. No black-breasted button-quails were recorded on remote surveillance cameras during the 2024 biennial monitoring event. This is the second time black-breasted button-quails have not been detected on the remote cameras since the 2020 baseline survey. A more extended remote camera survey is recommended during the Year 5 (2026) biennial monitoring event to obtain supporting evidence of the species' presence in addition to evidence of species presence (i.e. scats and platelets).

Plate 4.8 Faecal scat of the black-breasted button-quail observed at AU S2-1

Plate 4.9 Black-breasted button-quail platelets at AU S4-1 (left) and AU S4-2 (right)

Legend

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

CURRA

WOOND JM

Six Mile Creek

KEEFTON ROAD

AU-S1

102SP297908

AU-S2

Mary River

3SP302524

AU-S4

AU-S4

AU-S6

AU-S4

AU-S4

AU-S6

AU-S4

2SP302526

AU-S6

AU-S4

AU-S2

WOONDUM STATE FOREST

DAWN ROAD

BRUCE HIGHWAY

Mary River

Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Distribution of black-breasted button-quail records in 2024 Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 4.9

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_007_Dist_of_BBBQ_Recorded_Field_Surveys_2024
Print date: 22 Aug 2024 - 10:47

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint (2020), Field Survey (2024), Offset Site, Assessmet Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

5. Weed infestation

5.1 Weed densities

Of the 40 weed monitoring quadrats monitored in 2024, eleven sites recorded a combined weed density[4] of target weed species of 50% or greater, with only five of those exceeding 80% (namely C1-1, N7-4, S3-1, S5-1 and S6-1). The most common target weeds observed across the monitoring quadrats in the 2024 monitoring event were *Lantana camara* and *Passiflora suberosa* which aligns with the target species from the Year 1 and baseline survey events. Thirteen quadrats had combined weed covers of less than 10% which is a direct result from the ongoing active weed management occurring across the offset areas. Target weed densities recorded within monitoring quadrats during the 2024 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 2024 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					6.0		1.0	25.0				2.0		2.0		1.0				37.0
N2-1								25.0	15.0			5.0								45.0
N3-1								0.5				10.0								10.5
N3-2								1.0				0.5								1.5
N4-1								0.5				8.0								8.5
N4-2							3.0	0.2				0.5		0.5		1.0				5.2
N4-3								1.5	18.0			6.0								25.5
N5-1												1.0								1.0
N6-1								28.0	2.0			10.0								40.0
N6-2								15.0				12.0								27.0
N6-3								1.0				40.0								41.0
N6-4								50.0				3.0								53.0
N7-1								25.0			1.0	12.0								38.0
N7-2								30.0				6.0								36.0
N7-3								70.0				6.0								76.0
N7-4								80.0				15.0								95.0
N7-5								0.5				10.0								10.5
N7-6								2.0				30.0								32.0
N7-7								3.0				45.0								48.0
N7-8								3.0				8.0								11.0
N7-9								10.0				30.0								40.0
N7-10								2.5				13.0								15.5

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.	
N8-1								0.1				0.2								0.3
N9-1																			1.5	1.5
C1-1																		98.0		98.0
C1-2								60.0				2.0								62.0
C1-3							3.0	0.1		1.0		1.0								5.1
C1-4								0.5		0.5		1.0								2.0
Alt C2-1								50.0				5.0								55.0
C2-2								0.5		1.0		0.5			0.5					2.5
S1-1				9.0			0.5													9.5
S2-1		0.1						5.0				2.0			6.0		0.1			13.2
S2-2							14.0	30.0				25.0								69.0
S2-3							5.0					2.0								7.0
S3-1					12			75.0		1.0		9.0					1.0			98.0
S4-1							0.5	50.0	3.0			10.0								63.5
S4-2							2.0					0.5								2.5
S5-1									85.0			0.3								85.3
S6-1							0.5	80.0				4.0								84.5
S7-1	0.1			0.1			0.1					1.0			0.5					1.8

5.2 Baseline data comparison

The majority of the weed monitoring quadrats assessed[5] showed a 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). The Year 3 2024 results recorded 12 substantial increases and 22 substantial decreases in combined weed cover, only 35.29% of the substantial changed were attributed to increases. The remaining six sites showed no substantial change (i.e. less than 20 percentage points). Combined target weed densities for respective quadrats in 2020, 2022, and 2024 together with the observed change in densities between baseline (2020) and Year 3 (2024) 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 for six representative sites (three greatest increases and three greatest decreases). Photographs provided have been taken from the same photo reference point and from the same aspect as the baseline monitoring event in 2020 for comparison.

Figure 5.1 shows a spatial representation of the weed monitoring sites which achieved either a substantial increase, substantial decrease or no substantial change in weed density during this assessment compared to the baseline. These figures present the opportunities for focus areas to increase weed control efforts in areas of substantial increase, whilst maintaining weed control efforts in areas of substantial decrease to maintain the reduced level of weeds observed. Whilst there does not appear to be any strong correlations between access, flooding or adjacent land use with substantial decreases at this stage, there appears to be clustering in certain areas that may highlight areas of focus for future efforts.

In the northern AUs, there is a cluster of four substantial decreases in the northern portion of Lot 889 on CP864404, whilst the there is a mix of results in the remaining lot on plans (Figure 5.1). In the central AUs, the three monitoring quadrats north of the Project footprint observed substantial increases, whilst the three monitoring quadrats to the south of the Project footprint observed substantial decreases (Figure 5.1). In the southern AUs, there is a cluster of four substantial decreases in Lot 102 on SP297908 to the west of the Project footprint. Whilst there is a mix of results, generally tending towards substantial increases, in the remaining lot on plans to the east of the Project footprint (Figure 5.1).

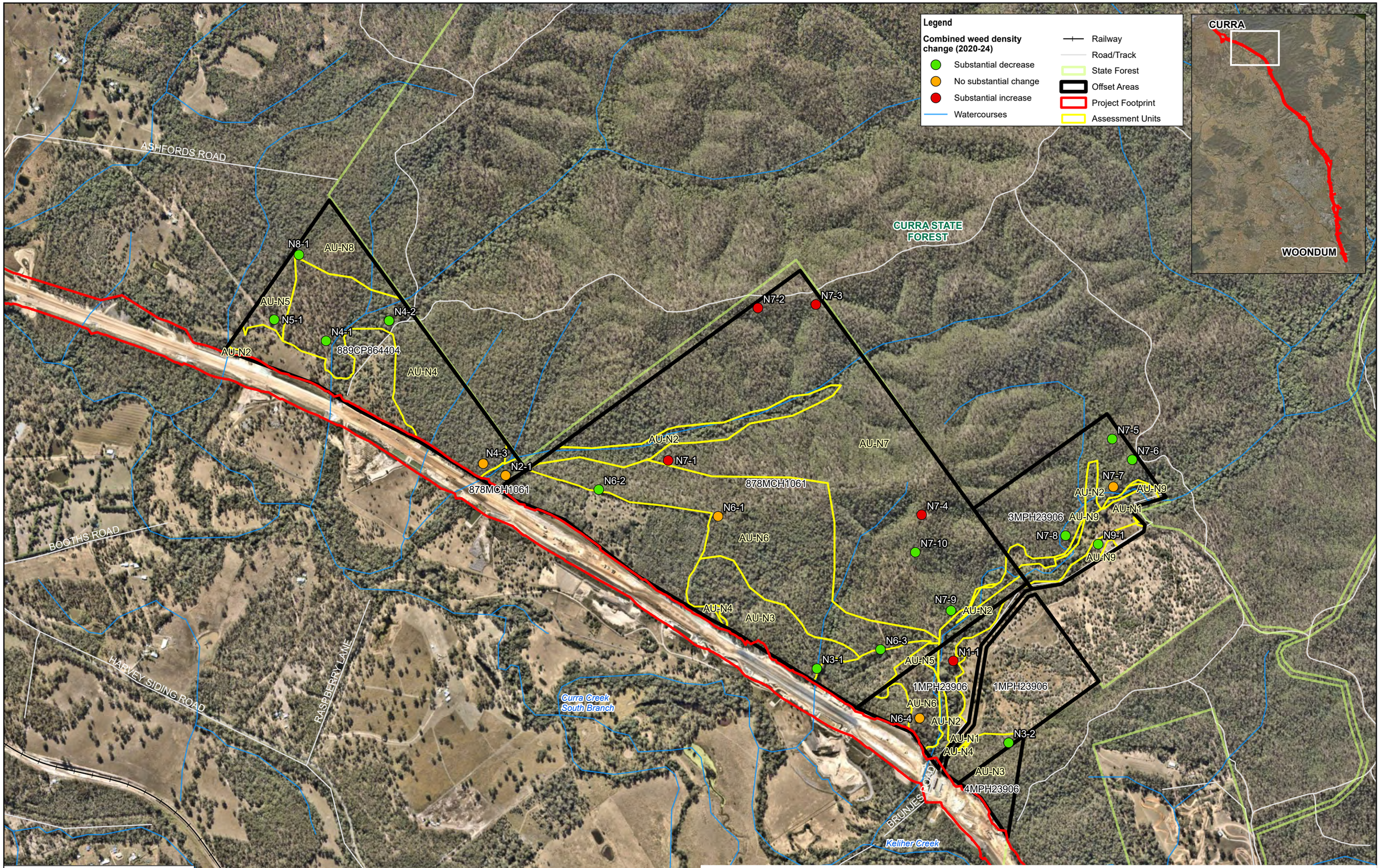
Table 5.2 Changes in combined densities of target weed species between 2020, 2022 and 2024

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Combined cover 2024 (%)	Change from 2020 to 2024 (percentage points)
N1-1	29.0	26.5	37.0	27.6
N2-1	50.0	52.0	45.0	-10.0
N3-1	84.0	5.0	10.5	-87.5
N3-2	52.0	58.0	1.5	-97.1
N4-1	40.0	41.0	8.5	-78.8
N4-2	49.0	36.0	5.2	-89.4
N4-3	28.0	33.0	25.5	-8.9
N5-1	50.0	42.5	1.0	-98.0
N6-1	38.0	30.5	40.0	5.3
N6-2	105.0	108.0	27.0	-74.3
N6-3	55.0	50.0	41.0	-25.5
N6-4	45.0	30.5	53.0	17.8
N7-1	30.0	23.0	38.0	26.7
N7-2	21.0	21.0	36.0	71.4

[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 (%)	Combined cover 2024 (%)	Change from 2020 to 2024 (percentage points)
N7-3	48.0	65.0	76.0	58.3
N7-4	45.0	63.0	95.0	111.1
N7-5	55.0	77.0	10.5	-80.9
N7-6	59.0	80.0	32.0	-45.8
N7-7	53.0	37.0	48.0	-9.4
N7-8	25.0	38.0	11.0	-56.0
N7-9	80.0	60.0	40.0	-50.0
N7-10	22.0	50.0	15.5	-29.5
N8-1	31.0	21.0	0.3	-99.0
N9-1	4.0	0.0	1.5	-62.5
C1-1	70.0	90.0	98.0	40.0
C1-2	37.0	55.5	62.0	67.6
C1-3	47.0	42.0	5.1	-89.1
C1-4	80.0	9.0	2.0	-97.5
Alt C2-1		40.0	55.0	37.5
C2-2	84.0	89.0	2.5	-97.0
S1-1	19.0	7.5	9.5	-50.0
S2-1	69.0	1.5	13.2	-80.9
S2-2	57.0	65.0	69.0	21.1
S2-3	51.0	59.0	7.0	-86.3
S3-1	30.0	42.0	98.0	226.7
S4-1	47.0	59.0	63.5	35.1
S4-2	66.0	81.5	2.5	-96.2
S5-1	87.0	87.0	85.3	-2.0
S6-1	54.0	79.0	84.5	56.5
S7-1	56.0	37.5	1.8	-96.8

Green shading – substantial decrease in combined weed densities
Red shading – substantial increase in combined weed densities



Data Disclaimer

© 2024. Whilst every care has been taken to prepare this map, TMR, GHD and DoR make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

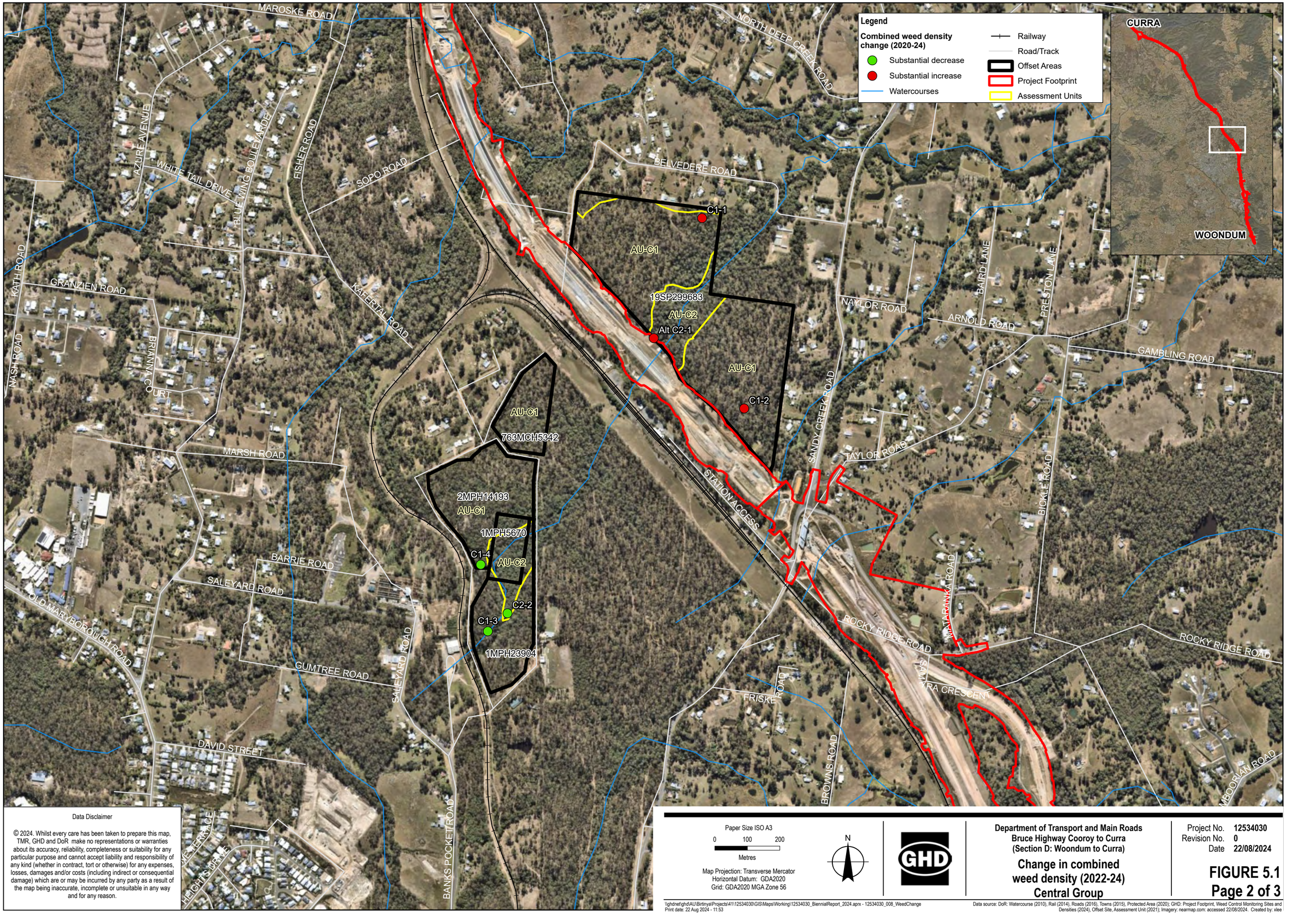
Change in combined weed density (2022-24) Northern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 5.1
Page 1 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_008_WeedChange
Print date: 22 Aug 2024 - 11:52

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites and Densities (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

© 2024. Whilst every care has been taken to prepare this map, TMR, GHD and DoR make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

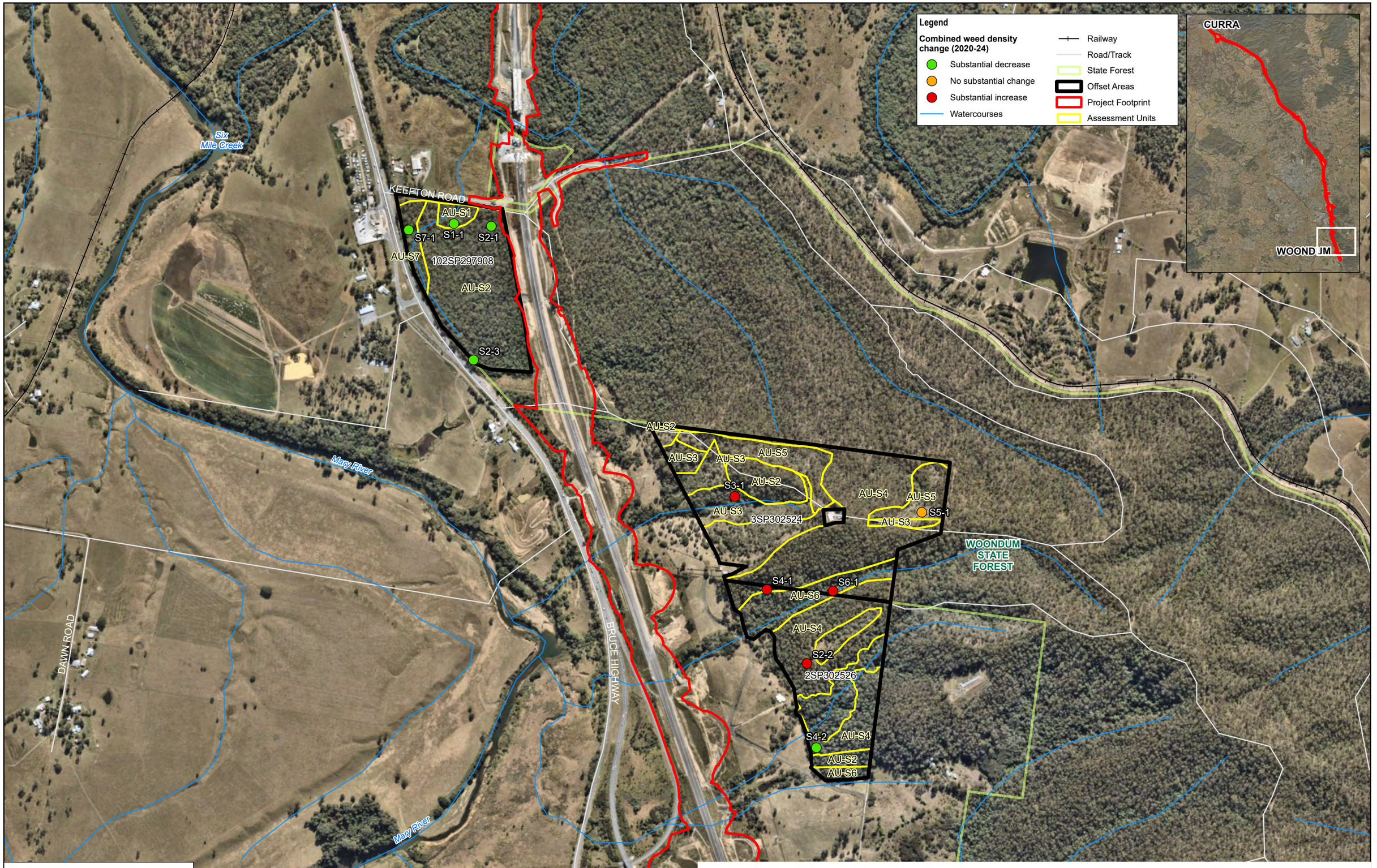
Change in combined weed density (2022-24) Central Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 5.1 Page 2 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_008_WeedChange
Print date: 22 Aug 2024 - 11:53

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites and Densities (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee



Data Disclaimer

Paper Size ISO A3

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

GHD

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

Change in combined weed density (2022-24) Southern Group

Project No. **12534030**
Revision No. **0**
Date **22/08/2024**

FIGURE 5.1
Page 3 of 3

\\ghdnet\ghd\AU\Birtinya\Projects\41\12534030\GIS\Maps\Working\12534030_BiennialReport_2024.aprx - 12534030_008_WeedChange
Print date: 22 Aug 2024 - 11:33

Data source: DoR: Watercourse (2010), Rail (2014), Roads (2016), Towns (2015), Protected Area (2020); GHD: Project Footprint, Weed Control Monitoring Sites and Densities (2024), Offset Site, Assessment Unit (2021); Imagery: nearmap.com: accessed 22/08/2024. Created by: xlee

6. Progress towards ecological outcomes

The following sections have 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.

6.1 Koala habitat value and density

The 2024 (Year 3) monitoring event has again recorded minor improvements in habitat value for the koala. This outcome is consistent with expectations, given the early stage of the delivery of the offset obligations and commencement of active management actions. Improvements in koala habitat quality scores were attributed to a slight increase in scores for foraging habitat quality, mobility and the absence of threats. Shelter habitat quality was unchanged.

The increase in foraging habitat quality was attributed to increased mobility in sites that have been subject to active weed management and an increase in food tree species richness in planted and regrowth sites, which has increased the amount of foraging resources available for the koala. The removal of rural residential blocks adjacent to the northern assessment units and the erection of fauna exclusion fencing along much of the projects' length has also reduced the threat of dog attacks within the local area.

The improvement in koala habitat values anticipated through the life of the offset will largely be reliant on active weed management. Further increased recruitment of koala food trees is expected in assessment units with low tree densities (i.e. AU N1 -1, N9-1). Planting has been relatively successful with the species richness of food trees and the shelter scores are expected to increase substantially at those sites in coming years. Weed management has improved since the 2022 monitoring event, increasing koala mobility scores and contributing to improved quality of foraging habitat scores at a number of plots. As described in Section 5.2, the Year 3 2024 results recorded 12 substantial increases and 22 substantial decreases in combined weed cover, only 35.29% of the substantial changed were attributed to increases. The remaining six sites showed no substantial change (i.e. less than 20 percentage points). Continued and concentrated active weed management is recommended to continue initially at those sites where an increase was observed and active maintenance of weed cover is recommended for those monitoring quadrats where a decrease was recorded. By undertaking targeted weed management and weed maintenance, a continued improvement in scores is expected in 2026. With ongoing protection and maintenance, planting sites and natural recruitment sites are expected to increase substantially in value in coming years.

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, koala density is unlikely to increase dramatically over the life of the offset. Instead, achieving a 50% increase in koala density as required in Condition 12e, it is likely that an increase in koala *habitat utilisation* (i.e. an increase in the area of land that is actively utilised by koalas) will be achieved, as indicated by SAT scores. While this is a more realistic measure of offset success, koala utilisation scores were still somewhat lower than the levels recorded in the baseline survey in 2020. This is in part due to the reduced accessibility of a number of sites (i.e. AU S2-1, S2-2 and S7-1) that are located on the western side of Woondum State Forest and are only accessible via the underpass shown in Plate 4.2.

6.2 Black-breasted button-quail habitat value and density

The habitat values for the black-breasted button-quail were again reduced from those recorded in the baseline monitoring event in 2020. This is partly due to the significant amount of rain the local region has received over the year which has resulted in both overland flow and sheet erosion (AU S1-1 and AU S2-1). Increased overland flow across the assessment units has removed the amount of available leaf litter cover and depth which reduces the habitat quality scoring while also decreasing species detectability through removal of platelets. The removal of *Lantana camara* has caused a number of adverse effects in the short-term, resulting in a loss of shelter, a

reduction in the foraging habitat value in sites where carpet grass has proliferated, and an increase in the threat of predation from cats. Weed management is anticipated to provide positive long-term effects on the black-breasted button-quail. However, a staged approach is recommended for the removal of lantana to maintain some of the values that lantana performs for the species, allowing native shrub and understory vegetation species to recolonize areas that have been subject to progressive weed control.

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 reaccumulates and associated invertebrate communities recover within the ground layer.

Weed management across the AUs applicable to the black-breasted button-quail offset areas (S1, S2, S4 and S6) varies. Of the seven weed monitoring quadrats applicable to the black-breasted button-quail, four sites recorded a substantial decrease in weed cover, while the remaining three sites recorded a substantial increase (Section 5.2). Those sites where a substantial decrease were recorded are recommended for ongoing maintenance of weed cover which will also allow native shrub and understory species to grow, while those sites where a substantial increase was recorded are recommended for targeted weed management early in the two years between biennial monitoring. Early targeting of these areas will allow for the native shrub and understory species to grow and result in an improved overall habitat value for the black-breasted button-quail by the next biennial monitoring event (Year 5, 2026).

6.3 Habitat quality

6.3.1 BioCondition

The overall average BioCondition scores (i.e. across all AUs) increased to 49.7 (out of a possible score of 80), from previous scores of 48.8 in 2022 and 43.9 in 2020. Further interrogation of the data reveals that all but two AU recorded an improvement in the BioCondition score when compared to baseline data. AUSN1 and AUSN2 were the exceptions, whereby the BioCondition scores dropped slightly from 25.0 to 24.5 and 45.5 to 44.0 respectively.

Whilst this overall result is encouraging, 4 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 total average score of 100 in 2020. The score dropped to 84.8 in 2022, then dropped again to 76.8 in 2024. This is largely a consequence of increased native perennial grass cover in plots (overlying the litter), with grass cover receiving a low total average score of 21.2 in 2020 which increase by 46.6 percentage points to 67.8 in 2024. 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. Increase in large trees is gradual due to uncontrollable factors such as each specific species growth rates, response to climatic changes (i.e., flood, drought etc), available nutrient levels, or level of competition, therefore whilst management actions such as replanting or managing weeds may increase growth rates, it does not allow for an estimate of when trees will reach the threshold to create a measurable improvement. As the approach to large trees is a dbh threshold, this does not account for how close each tree is to meeting the threshold, therefore while some individuals may reach the threshold in the short term, others may be in a current juvenile state and not meet the threshold during the life of the offset. 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 33.95% in 2024, which represents a 31.83% reduction from baseline level. This represents a substantial reduction compared to a reduction of only 5.89% between baseline and the results reported during the Year 1, 2022 monitoring event (50.28% reduced to 47.31%). It is evident that TMR has undertaken a significant effort in reducing the total weed density cover across the offset areas within the two years since the previous monitoring event. Of the 40 weed monitoring quadrats assessed, more than half (N=26) recorded a reduction in combined cover of target weeds, with 22 quadrats exhibiting a substantial reduction in cover (i.e. decrease of at least 20% cover compared to baseline data).

Condition 12.d. of EPBC 2017/7941 states:

'*Demonstrate the following reductions in weed infestation in all of the Koala offset areas and the Black-breasted Button-quail offset area compared to the baseline data reported as required under condition 11a: i. 50% reduction within 3 years of completing the baseline surveys required by Condition 11a*'.

Baseline surveys required under Condition 11a were completed in November 2020 and reported on in the *Bruce Highway (Cooroy to Curra) Section D - Commonwealth Offset Delivery Baseline Assessment Report* (GHD 2020) dated July 2021 and provided to the Department on 25 August 2021.

This current round of biennial monitoring (April, 2024) marks slightly longer than the 3 years post baseline survey milestone (November, 2020). The weed infestation survey results conclude the following reduction in total weed density cover:

– 31.83% reduction across the koala offset areas
– 31.35% reduction across the black-breasted button-quail offset areas

Consequently, compliance with Condition 12.d has not yet been achieved despite concentrated efforts to reduce weed densities across the offset areas. As previously reported, the offset areas applicable to these conditions occur over a wide expanse (280.6 ha) which increases the difficulties of weed management. Furthermore, the region has received significant rainfall within the last 6 months, with several heavy rainfall events associated with ex-severe tropical cyclones Jasper and Kirrily occurring in December 2023 and January 2024 respectively which has the potential to either negatively influence results by encouraging weed growth and restricting access for both the habitat restoration and weed control programs or positively influence results by encouraging native growth and regeneration.

Figure 5.1 shows a spatial representation of the weed monitoring sites which achieved either a substantial increase, substantial decrease or no substantial change in weed density during this assessment compared to the baseline. These figures present the opportunities for focus areas to increase weed control efforts in areas of substantial increase, whilst maintaining weed control efforts in areas of substantial decrease to maintain the reduced level of weeds observed. Whilst there does not appear to be any strong correlations between access, flooding or adjacent land use with substantial decreases at this stage, there appears to be clustering in certain areas that may highlight areas of focus for future efforts.

As per Condition 21 and 22 of EPBC 2017/7941 TMR is required to complete the following:

Reporting non-compliance

21. The approval holder must notify the Department in writing of any: incident; non-compliance with the conditions; or non-compliance with the commitments made in plans. The notification must be given as soon as practicable, and no later than 5 business days after becoming aware of the incident or non-compliance. The notification must specify:

a. the condition which is or may be in breach; and
b. a short description of the incident and or non-compliance.

22. The approval holder must provide to the Department the details of any incident or non-compliance with the conditions or commitments made in plans as soon as practicable and no later than 10 business days after becoming aware of the incident or non-compliance, specifying:

a. any corrective action or investigation which the approval holder has already taken or intends to take in the immediate future;
b. the potential impacts of the incident or non-compliance; and
c. the method and timing of any remedial action that will be undertaken by the approval holder.

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 %	Average	Benchmark	Site 1 (N2 - 1)			Average %	Average	Benchmark	Site 1 (N3 - 1)			Site 2 (N3 - 2)			Average %	Average
	12.3.11	Raw Data	% Benchmark	Score	benchmark	Score	12.3.11	Raw Data	% Benchmark	Score	benchmark	Score	12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	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	60	60.0	3	80	4
Native plant species richness - trees	7	10	142.9	5	142.9	5	7	20	285.7	5	285.7	5	10	10	100.0	5	14	140.0	5	120	5
Native plant species richness - shrubs	7	6	85.7	2.5	85.7	2.5	7	13	185.7	5	185.7	5	5	7	140.0	5	7	140.0	5	140	5
Native plant species richness - grasses	12	5	41.7	2.5	41.7	2.5	12	3	25.0	2.5	25	2.5	6	8	133.3	5	10	166.7	5	150	5
Native plant species richness - forbes	25	13	52.0	2.5	52	2.5	25	10	40.0	2.5	40	2.5	17	16	94.1	5	24	141.2	5	117.7	5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			0	8.7	0	0			5	120.9	5	0			4			4	71.7	4
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			1	17	1	0			4	155.6	4	0			2.5			5	90.8	3.8
Shrub canopy cover	20	0.5	2.5	0	2.5	0	20	5	25.0	3	25	3	27	17	63.0	5	19.5	72.2	5	67.6	5
Native grass cover	44	37	84.1	3	84.1	3	44	61	138.6	5	138.6	5	35	13	37.1	1	41	117.1	5	77.1	3
Organic litter	37	16	43.2	3	43.2	3	37	3	8.1	0	8.1	0	55	9	16.4	3	28	50.9	5	33.7	4
Large trees (euc plus non-euc)	30	0	0.0	0	0	0	30	1	3.3	5	3.3	5	30	6	20.0	5	8	26.7	5	23.4	5
Coarse woody debris	555	0	0.0	0	0	0	555	100	18.0	2	18	2	401	360	89.8	5	800	199.5	5	144.7	5
Non-native plant cover	0	50	50.0	0	50	0	0	65	65.0	0	65	0	0	70	70.0	0	29	29.0	3	49.5	1.5
Quality and availability of food and foraging habitat				1.3		1.3				3.5		3.5				6			6.2		6.1
Quality and availability of shelter				0.8		0.8				6.5		6.5				3.4			6.5		5
Site Condition Score				26.6		26.6				54		54				59.9			72.7		66.4
MAX Site Condition Score				*100*		*100*				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3						**0.80**						**1.62**									**1.99**
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				0.8		0.8				2.5		2.5				4.1			4.1		4.1
Threats to the species				5		5				7.5		7.5				7.5			7.5		7.5
Species mobility capacity				5.8		5.8				6		6				7.5			9.2		8.4
Site Context Score				28.6		28.6				35		35				38.1			39.8		39
MAX Site Context Score				*56*		*56*				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3						**1.53**						**1.88**									**2.09**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU N4 - RE 12.9-10.17b Remnant									AU N5 - RE 12.9-10.17b Regrowth					
Site Reference	Benchmark	Site 1 (N4 - 1)			Site 2 (N4 - 2)			Average %	Average	Benchmark	Site 1 (N5 - 1)			Average %	Average
	12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score	12.9-10.17b	Raw Data	% Benchmark	Score	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
Native plant species richness - trees	10	13	130.0	5	15	150.0	5	140	5	10	10	100.0	5	100	5
Native plant species richness - shrubs	5	6	120.0	5	7	140.0	5	130	5	5	9	180.0	5	180	5
Native plant species richness - grasses	6	9	150.0	5	12	200.0	5	175	5	6	13	216.7	5	216.7	5
Native plant species richness - forbes	17	18	105.9	5	21	123.5	5	114.7	5	17	24	141.2	5	141.2	5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5	90.8	5	0			4	77.8	4
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			5			5	110.7	5	0			3.5	94.6	3.5
Shrub canopy cover	27	11.5	42.6	3	6.5	24.1	3	33.4	3	27	4	14.8	3	14.8	3
Native grass cover	35	39	111.4	5	30	85.7	3	98.6	4	35	39	111.4	5	111.4	5
Organic litter	55	8	14.5	3	54	98.2	5	56.4	4	55	18	32.7	3	32.7	3
Large trees (euc plus non-euc)	30	11	36.7	5	5	16.7	5	26.7	5	30	0	0.0	0	0	0
Coarse woody debris	401	80	20.0	2	570	142.1	5	81.1	3.5	401	380	94.8	5	94.8	5
Non-native plant cover	0	30	30.0	3	5	5.0	5	17.5	4	0	20	20.0	5	20	5
Quality and availability of food and foraging habitat				6.8			5.8		6.3				7.1		7.1
Quality and availability of shelter				3.7			6		4.9				3.6		3.6
Site Condition Score				66.5			72.8		69.7				64.2		64.2
MAX Site Condition Score				*100*			*100*		*100*				*100*		*100*
Site Condition Score - out of 3									**2.09**						**1.93**
Site Context															
Size of patch				10			10		10				10		10
Connectedness				2			2		2				2		2
Context				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
Threats to the species				10			10		10				10		10
Species mobility capacity				7.5			7.3		7.4				10		10
Site Context Score				38.6			37.6		38.1				41.1		41.1
MAX Site Context Score				*56*			*56*		*56*				*56*		*56*
Site Context Score - out of 3									**2.04**						**2.20**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU N6 - RE 12.9-10.17b Remnant									AU N7 - RE 12.11.5 Remnant										
Site Reference	Benchmark	Site 1a (N6 - 1a)			Site 2 (N6 - 2)			Average %	Average	Benchmark	Site 1 (N7 - 1)			Site 2a (N7 - 2a)			Site 3 (N7 - 3)			Average %	Average
	12.9-10.17b	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score
Site Condition																					
Recruitment of woody perennial species in EDL	100	80	80.0	5	80	80.0	5	80	5	100	100	100.0	5	60	60.0	3	75	75.0	5	78.3	4.3
Native plant species richness - trees	10	15	150.0	5	14	140.0	5	145	5	7	10	142.9	5	12	171.4	5	12	171.4	5	161.9	5
Native plant species richness - shrubs	5	6	120.0	5	9	180.0	5	150	5	11	10	90.9	5	7	63.6	2.5	10	90.9	5	81.8	4.2
Native plant species richness - grasses	6	11	183.3	5	9	150.0	5	166.7	5	8	11	137.5	5	6	75.0	2.5	10	125.0	5	112.5	4.2
Native plant species richness - forbes	17	17	100.0	5	11	64.7	2.5	82.4	3.8	17	21	123.5	5	26	152.9	5	16	94.1	5	123.5	5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			4			4	73.2	4	0			5			5			5	85.3	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			5			4	136.1	4.5	0			2.5			4			2.5	282.7	3
Shrub canopy cover	27	8	29.6	3	7	25.9	3	27.8	3	14	19	135.7	5	20	142.9	5	9	64.3	5	114.3	5
Native grass cover	35	14.6	41.7	1	14.2	40.6	1	41.2	1	30	15	50.0	3	19	63.3	3	49	163.3	5	92.2	3.7
Organic litter	55	36	65.5	5	30	54.5	5	60	5	50	58	116.0	5	33	66.0	5	20	40.0	3	74	4.3
Large trees (euc plus non-euc)	30	6	20.0	5	6	20.0	5	20	5	26	2	7.7	5	4	15.4	5	2	7.7	5	10.3	5
Coarse woody debris	401	1170	291.8	2	150	37.4	2	164.6	2	457	750	164.1	5	410	89.7	5	750	164.1	5	139.3	5
Non-native plant cover	0	35	35.0	3	25	25.0	3	30	3	0	40	40.0	3	50	50.0	0	30	30.0	3	40	2
Quality and availability of food and foraging habitat				6.8			7.2		7				5			4.6			5		4.9
Quality and availability of shelter				5.1			6.1		5.6				5.3			6.9			5.1		5.8
Site Condition Score				64.9			62.8		63.9				68.8			61.5			68.6		66.4
MAX Site Condition Score				*100*			*100*		*100*				*100*			*100*			*100*		*100*
Site Condition Score - out of 3									**1.92**												**1.99**
Site Context																					
Size of patch				10			10		10				10			10			10		10
Connectedness				4			4		4				5			5			5		5
Context				5			5		5				5			5			5		5
Role of site location to species overall population in the state				4.1			3.3		3.7				5			4.1			4.1		4.4
Threats to the species				10			7.5		8.8				10			10			7.5		9.2
Species mobility capacity				10			9.2		9.6				10			8.3			10		9.4
Site Context Score				43.1			39		41.1				45			42.4			41.6		43
MAX Site Context Score				*56*			*56*		*56*				*56*			*56*			*56*		*56*
Site Context Score - out of 3									**2.20**												**2.30**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU N8 - RE 12.11.5 Remnant						AU N9 - RE 12.9-10.17b Regrowth						AU C1 - RE 12.11.5 Remnant							
Site Reference	Benchmark	Site 1 (N8 - 1)			Average %	Average	Benchmark	Site 1 (N9 - 1)			Average %	Average	Benchmark	Site 1 (C1 - 1)			Site 2 (C1 - 2)			Average %	Average
	12.11.5	Raw Data	% Benchmark	Score	benchmark	Score	12.9-10.17b	Raw Data	% Benchmark	Score	benchmark	Score	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	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	50	50.0	3	80	80.0	5	65	4
Native plant species richness - trees	7	10	142.9	5	142.9	5	10	7	70.0	2.5	70	2.5	7	10	142.9	5	13	185.7	5	164.3	5
Native plant species richness - shrubs	11	10	90.9	5	90.9	5	5	6	120.0	5	120	5	11	4	36.4	2.5	10	90.9	5	63.7	3.8
Native plant species richness - grasses	8	9	112.5	5	112.5	5	6	4	66.7	2.5	66.7	2.5	8	8	100.0	5	7	87.5	2.5	93.8	3.8
Native plant species richness - forbes	17	10	58.8	2.5	58.8	2.5	17	8	47.1	2.5	47.1	2.5	17	14	82.4	2.5	13	76.5	2.5	79.5	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	114.4	5	0			1.5	23.4	1.5	0			5			5	103.5	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			1.5	260.7	1.5	0			0	4.9	0	0			4			5	135.7	4.5
Shrub canopy cover	14	3.2	22.9	3	22.9	3	27	8	29.6	3	29.6	3	14	7	50.0	5	11.5	82.1	5	66.1	5
Native grass cover	30	9	30.0	1	30	1	35	32	91.4	5	91.4	5	30	40	133.3	5	73	243.3	5	188.3	5
Organic litter	50	71	142.0	5	142	5	55	8	14.5	3	14.5	3	50	21	42.0	3	23.6	47.2	3	44.6	3
Large trees (euc plus non-euc)	26	4	15.4	5	15.4	5	30	0	0.0	0	0	0	26	6	23.1	5	8	30.8	5	27	5
Coarse woody debris	457	20	4.4	0	4.4	0	401	0	0.0	0	0	0	457	520	113.8	5	720	157.5	5	135.7	5
Non-native plant cover	0	2	2.0	10	2	10	0	75	75.0	0	75	0	0	10	10.0	5	1	1.0	10	5.5	7.5
Quality and availability of food and foraging habitat				5.4		5.4				2.5		2.5				5.3			5.1		5.2
Quality and availability of shelter				3.8		3.8				0.9		0.9				4.6			4.2		4.4
Site Condition Score				62.2		62.2				33.4		33.4				64.9			72.3		68.7
MAX Site Condition Score				*100*		*100*				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3						**1.87**						**1.00**									**2.06**
Site Context																					
Size of patch				10		10				10		10				10			10		10
Connectedness				5		5				2		2				5			5		5
Context				5		5				5		5				4			4		4
Role of site location to species overall population in the state				3.3		3.3				0.8		0.8				4.1			5		4.6
Threats to the species				10		10				5		5				5			5		5
Species mobility capacity				8.3		8.3				4		4				8.3			7.3		7.8
Site Context Score				41.6		41.6				26.8		26.8				36.4			36.3		36.4
MAX Site Context Score				*56*		*56*				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3						**2.23**						**1.44**									**1.95**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU C2 - RE 12.3.11 Remnant						AU S1 - RE 12.11.3 Remnant						AU S2 - RE 12.11.3 Remnant							
Site Reference	Benchmark	Site 1 (C2 - 1)			Average %	Average	Benchmark	Site 1 (S1 - 1)			Average %	Average	Benchmark	Site 1 (S2 - 1)			Site 2 (S2 - 2)			Average %	Average
	12.3.11	Raw Data	% Benchmark	Score	benchmark	Score	12.11.3	Raw Data	% Benchmark	Score	benchmark	Score	12.11.3	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score
Site Condition																					
Recruitment of woody perennial species in EDL	100	66.7	66.7	3	66.7	3	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	22	314.3	5	314.3	5	6	12	200.0	5	200	5	6	29	483.3	5	30	500.0	5	491.7	5
Native plant species richness - shrubs	7	25	357.1	5	357.1	5	12	16	133.3	5	133.3	5	12	27	225.0	5	24	200.0	5	212.5	5
Native plant species richness - grasses	12	3	25.0	2.5	25	2.5	4	3	75.0	2.5	75	2.5	4	5	125.0	5	6	150.0	5	137.5	5
Native plant species richness - forbes	25	13	52.0	2.5	52	2.5	21	10	47.6	2.5	47.6	2.5	21	12	57.1	2.5	15	71.4	2.5	64.3	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	104.1	5	0			5	107	5	0			5			5	102.5	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4	177.8	4	0			4	295.3	4	0			4			4	259	4
Shrub canopy cover	20	15.5	77.5	5	77.5	5	21	12	57.1	5	57.1	5	21	8	38.1	3	38	181.0	5	109.6	4
Native grass cover	44	66	150.0	5	150	5	16	32	200.0	5	200	5	16	62	387.5	5	60	375.0	5	381.3	5
Organic litter	37	34	91.9	5	91.9	5	76	44	57.9	5	57.9	5	76	11	14.5	3	12	15.8	3	15.2	3
Large trees (euc plus non-euc)	30	4	13.3	5	13.3	5	63	3	4.8	5	4.8	5	63	2	3.2	5	6	9.5	5	6.4	5
Coarse woody debris	555	250	45.0	2	45	2	370	160	43.2	2	43.2	2	370	1350	364.9	2	680	183.8	5	274.4	3.5
Non-native plant cover	0	35	35.0	3	35	3	0	5	5.0	5	5	5	0	12	12.0	5	25	25.0	3	18.5	4
Quality and availability of food and foraging habitat				3.9		3.9				3.5		3.5				3.2			4.5		3.9
Quality and availability of shelter				8.3		8.3				8		8				6.3			6.3		6.3
Site Condition Score				64.2		64.2				62.5		62.5				62			66.3		64.2
MAX Site Condition Score				*100*		*100*				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3						**1.93**						**1.88**									**1.93**
Site Context																					
Size of patch				10		10				2		2				10			10		10
Connectedness				5		5				4		4				4			4		4
Context				4		4				4		4				4			4		4
Role of site location to species overall population in the state				3.3		3.3				5		5				5			5		5
Threats to the species				7.5		7.5				10		10				10			10		10
Species mobility capacity				6.8		6.8				5.8		5.8				5			5.8		5.4
Site Context Score				36.6		36.6				30.8		30.8				38			38.8		38.4
MAX Site Context Score				*56*		*56*				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3						**1.96**						**1.65**									**2.06**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU S3 - RE 12.11.3 Regrowth						AU S4 - RE 12.11.5 Remnant											
Site Reference	Benchmark	Site 1 (S3 - 1)			Average %	Average	Benchmark	Site 1 (S4 - 1)			Site 2 (S4 - 2)			Site 3 (S4 - 3)			Average %	Average
	12.11.3	Raw Data	% Benchmark	Score	benchmark	Score	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score
Site Condition																		
Recruitment of woody perennial species in EDL	100	75	75.0	5	75	5	100	66	66.0	3	100	100.0	5	100	100.0	5	88.7	4.3
Native plant species richness - trees	6	14	233.3	5	233.3	5	7	20	285.7	5	32	457.1	5	28	400.0	5	380.9	5
Native plant species richness - shrubs	12	9	75.0	2.5	75	2.5	11	24	218.2	5	20	181.8	5	25	227.3	5	209.1	5
Native plant species richness - grasses	4	12	300.0	5	300	5	8	2	25.0	2.5	3	37.5	2.5	7	87.5	2.5	50	2.5
Native plant species richness - forbes	21	14	66.7	2.5	66.7	2.5	17	22	129.4	5	15	88.2	2.5	15	88.2	2.5	101.9	3.3
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	116	5	0			5			5			5	97.9	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4	270.2	4	0			4			4			4	278.1	4
Shrub canopy cover	21	7	33.3	3	33.3	3	14	26	185.7	5	9.2	65.7	5	18	128.6	5	126.7	5
Native grass cover	16	27	168.8	5	168.8	5	30	10	33.3	1	3.4	11.3	1	4.8	16.0	1	20.2	1
Organic litter	76	34	44.7	3	44.7	3	50	56	112.0	5	38	76.0	5	54	108.0	5	98.7	5
Large trees (euc plus non-euc)	63	3	4.8	5	4.8	5	26	7	26.9	5	2	7.7	5	4	15.4	5	16.7	5
Coarse woody debris	370	230	62.2	5	62.2	5	457	490	107.2	5	1140	249.5	2	1030	225.4	2	194	3
Non-native plant cover	0	25	25.0	3	25	3	0	30	30.0	3	70	70.0	0	25	25.0	3	41.7	2
Quality and availability of food and foraging habitat				4.6		4.6				4.4			9.2			4.6		6.1
Quality and availability of shelter				6.7		6.7				8.5			5.6			7.5		7.2
Site Condition Score				64.3		64.3				66.4			61.8			62.1		63.4
MAX Site Condition Score				*100*		*100*				*100*			*100*			*100*		*100*
Site Condition Score - out of 3						**1.93**												**1.90**
Site Context																		
Size of patch				10		10				10			10			10		10
Connectedness				2		2				4			4			4		4
Context				5		5				4			4			4		4
Role of site location to species overall population in the state				3.3		3.3				4.1			3.3			3.3		3.6
Threats to the species				7.5		7.5				7.5			7.5			7.5		7.5
Species mobility capacity				9.2		9.2				7.7			9			10		8.9
Site Context Score				37		37				37.3			37.8			38.8		38
MAX Site Context Score				*56*		*56*				*56*			*56*			*56*		*56*
Site Context Score - out of 3						**1.98**												**2.04**

OFFSET - Fauna Species Koala

Assessment Unit - Regional Ecosystem	AU S5 - RE 12.11.5 Regrowth						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 (S7 - 1)			Average % benchmark	Average Score		
	12.11.5	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	50	50.0	3	50	3	79.98	4.23
Native plant species richness - trees	7	14	200.0	5	200	5	6	22	366.7	5	366.7	5	205.81	4.84
Native plant species richness - shrubs	11	10	90.9	5	90.9	5	12	22	183.3	5	183.3	5	144.11	4.56
Native plant species richness - grasses	8	11	137.5	5	137.5	5	4	4	100.0	5	100	5	117.85	3.94
Native plant species richness - forbes	17	8	47.1	2.5	47.1	2.5	21	17	81.0	2.5	81	2.5	77.28	3.26
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5	96.7	5	0			5	91	5	87.12	4.28
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4	255.6	4	0			4	249.8	4	176.55	3.43
Shrub canopy cover	14	25	178.6	5	178.6	5	21	19	90.5	5	90.5	5	61.68	3.75
Native grass cover	30	7.4	24.7	1	24.7	1	16	37.4	233.8	5	233.8	5	118.62	3.61
Organic litter	50	40	80.0	5	80	5	76	45.4	59.7	5	59.7	5	56.1	3.77
Large trees (euc plus non-euc)	26	2	7.7	5	7.7	5	63	7	11.1	5	11.1	5	11.24	4.06
Coarse woody debris	457	270	59.1	5	59.1	5	370	280	75.7	5	75.7	5	91.28	3
Non-native plant cover	0	65	65.0	0	65	0	0	2	2.0	10	2	10	34.04	3.13
Quality and availability of food and foraging habitat				4.8		4.8				6.6		6.6		4.76
Quality and availability of shelter				6.4		6.4				6.8		6.8		5.26
Site Condition Score				63.7		63.7				77.9		77.9		59.86
MAX Site Condition Score				*100*		*100*				*100*		*100*		*100*
Site Condition Score - out of 3						**1.91**						**2.34**		**1.80**
Site Context														
Size of patch				10		10				2		2		9.5
Connectedness				4		4				5		5		3.63
Context				5		5				4		4		4.69
Role of site location to species overall population in the state				3.3		3.3				5		5		3.47
Threats to the species				7.5		7.5				10		10		8
Species mobility capacity				6.7		6.7				4.2		4.2		7.47
Site Context Score				36.5		36.5				30.2		30.2		36.75
MAX Site Context Score				*56*		*56*				*56*		*56*		*56*
Site Context Score - out of 3						**1.96**						**1.62**		**1.97**

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 (*Total from*		5			
		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 S7	Final (Average)
Site Condition score (out of 3)	0.80	1.62	1.99	2.09	1.93	1.92	1.99	1.87	1.00	2.06	1.93	1.88	1.93	1.93	1.90	1.91	2.34	1.80
Site Context Score (out of 3)	1.53	1.88	2.09	2.04	2.20	2.20	2.30	2.23	1.44	1.95	1.96	1.65	2.06	1.98	2.04	1.96	1.62	1.97
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
Habitat Quality score (out of 10)	*4.62*	*5.79*	*6.37*	*6.42*	*6.42*	*6.41*	*6.58*	*6.39*	*4.73*	*6.30*	*6.18*	*5.82*	*6.28*	*6.20*	*6.23*	*6.16*	*6.25*	*6.06*
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	1.16	17.77
Total offset area (ha) for this MNES	303.31	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	288.24
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	0.00	0.06
Weighted Habitat Quality Score	***0.11***	***0.20***	***0.34***	***0.50***	***0.08***	***0.74***	***2.10***	***0.11***	***0.04***	***0.91***	***0.17***	***0.01***	***0.31***	***0.08***	***0.45***	***0.11***	***0.03***	***6.29***

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 (S1 - 1)			Average %	Average	Benchmark	Site 1 (S2 - 1)			Site 2 (S2 - 2)			Average %	Average
	12.3.11	Raw Data	% Benchmark	Score	benchmark	Score	12.11.3	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	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	16	228.6	5	228.6	5	12	27	225.0	5	24	200.0	5	212.5	5
Native plant species richness - grasses	12	3	25.0	2.5	25	2.5	4	5	125.0	5	6	150.0	5	137.5	5
Native plant species richness - forbes	25	10	40.0	2.5	40	2.5	21	12	57.1	2.5	15	71.4	2.5	64.3	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	184.8	4	0			4			4	259	4
Shrub canopy cover	20	12	60.0	5	60	5	21	8	38.1	3	38	181.0	5	109.6	4
Native grass cover	44	32	72.7	3	72.7	3	16	62	387.5	5	60	375.0	5	381.3	5
Organic litter	37	44	118.9	5	118.9	5	76	11	14.5	3	12	15.8	3	15.2	3
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	160	28.8	2	28.8	2	370	1350	364.9	2	680	183.8	5	274.4	3.5
Non-native plant cover	0	5	5.0	5	5	5	0	12	12.0	5	25	25.0	3	18.5	4
Quality and availability of food and foraging habitat				4.6		4.6				4.6			4		4.3
Quality and availability of shelter				4.9		4.9				5.9			6.4		6.2
Site Condition Score				58.5		58.5				63			65.9		64.5
MAX Site Condition Score				*100*		*100*				*100*			*100*		*100*
Site Condition Score - out of 3						**1.76**									**1.94**
Site Context															
Size of patch				2		2				10			10		10
Connectedness				4		4				4			4		4
Context				4		4				4			4		4
Role of site location to species overall population in the state				5		5				7			7		7
Threats to the species				2.5		2.5				5			2.5		3.8
Species mobility capacity				4		4				5			5		5
Site Context Score				21.5		21.5				35			32.5		33.8
MAX Site Context Score				*56*		*56*				*56*			*56*		*56*
Site Context Score - out of 3						**1.15**									**1.81**

OFFSET - Fauna Species Black-breasted button-quail

Assessment Unit - Regional Ecosystem	AU S4 - RE 12.11.5 Remnant													
Site Reference	Benchmark	Site 1 (S4 - 1)			Site 2 (S4 - 2)			Site 3 (S4 - 3)			Average %	Average	Total average %	Total average
	12.11.5	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	Raw Data	% Benchmark	Score	benchmark	Score	benchmark	score
Site Condition														
Recruitment of woody perennial species in EDL	100	66	66.0	3	100	100.0	5	100	100.0	5	88.7	4.3	29.2	1.5
Native plant species richness - trees	7	20	285.7	5	32	457.1	5	28	400.0	5	380.9	5	331.55	5
Native plant species richness - shrubs	11	24	218.2	5	20	181.8	5	25	227.3	5	209.1	5	220.55	5
Native plant species richness - grasses	8	2	25.0	2.5	3	37.5	2.5	7	87.5	2.5	50	2.5	81.25	3.75
Native plant species richness - forbes	17	22	129.4	5	15	88.2	2.5	15	88.2	2.5	101.9	3.3	52.15	2.5
Tree canopy height (average of emergent, canopy, sub-canopy)	0			5			5			5	97.9	5	113.9	5
Tree canopy cover (average of emergent, canopy, sub-canopy)	0			4			4			4	278.1	4	221.9	4
Shrub canopy cover	14	26	185.7	5	9.2	65.7	5	18	128.6	5	126.7	5	84.8	4.5
Native grass cover	30	10	33.3	1	3.4	11.3	1	4.8	16.0	1	20.2	1	227	4
Organic litter	50	56	112.0	5	38	76.0	5	54	108.0	5	98.7	5	67.05	4
Large trees (euc plus non-euc)	26	7	26.9	5	2	7.7	5	4	15.4	5	16.7	5	8.2	5
Coarse woody debris	457	490	107.2	5	1140	249.5	2	1030	225.4	2	194	3	151.6	2.75
Non-native plant cover	0	30	30.0	3	70	70.0	0	25	25.0	3	41.7	2	11.75	4.5
Quality and availability of food and foraging habitat				3.5			4.5			4.8		4.3		4.45
Quality and availability of shelter				6.1			4			5		5		5.55
Site Condition Score				63.1			55.5			59.8		59.4		61.5
MAX Site Condition Score				*100*			*100*			*100*		*100*		*100*
Site Condition Score - out of 3												**1.78**		**1.85**
Site Context														
Size of patch				10			10			10		10		6
Connectedness				4			4			4		4		4
Context				4			4			4		4		4
Role of site location to species overall population in the state				6			6			6		6		6
Threats to the species				2.5			2.5			5		3.3		3.15
Species mobility capacity				6			4			5		5		4.5
Site Context Score				32.5			30.5			34		32.3		27.65
MAX Site Context Score				*56*			*56*			*56*		*56*		*56*
Site Context Score - out of 3												**1.73**		**1.48**

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	Final (Average)
Site Condition score (out of 3)	1.76	1.94	1.78	1.85
Site Context Score (out of 3)	1.15	1.81	1.73	1.48
Species Stocking Rate Score (out of 4)	3.14	3.14	3.14	3.14
Habitat Quality score (out of 10)	*6.05*	*6.89*	*6.65*	*6.47*
Assessment Unit area (ha)	0.66	11.28	14.79	5.97
Total offset area (ha) for this MNES	26.73	26.73	26.73	26.73
Size Weighting	0.02	0.42	0.55	0.22
Weighted Habitat Quality Score	***0.15***	***2.91***	***3.68***	***6.74***

Appendix C

BioCondition Field Data

Site: N1 - 1	**Date**: 17/4/2024	**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) 6	
Eucalyptus tereticornis, Lophostemon suaveolens, Eucalyptus propinqua, Melaleuca quinquenervia, Lophostemon confertus, Corymbia intermedia	
Native grass species richness (50x10 m) 5	
Imperata cylindrica (blady grass), Eragrostis sp., Digitaria parviflora, Capillipedium spicigerum, Sacciolepis indica	
Native forbs/others species richness (50x10 m) 13	
Centella asiatica, Cyperus polystachyos, Fimbristylis dichotoma, Fuirena ciliaris, Cyperus sp. 2, Lobelia purpurascens, Commelina sp., Cyperus difformis, Scleria sp., Sphaeromorphaea australis, Phyllanthus virgatus, Ludwigia octovalvis, Murdannia graminea	
Non-native plant cover (50x10 m): 50	
Coarse woody debris (50x20 m): 0	
Coarse woody debris lengths (m): 0	
Quadrat 1	
Native perennial grass cover: 95	**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 2	
Native perennial grass cover: 35	**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: 5	**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 4	
Native perennial grass cover: 10	**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: 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	
Transect	
Plot bearing: South West	**Transect length:** 100m
Notes:	
Canopy: 19 m Details:	
Sub-canopy: None m Details:	
Shrub: 0.5 m Details:	
Photos	
Point: 152.63384974758807, -26.06598916103591	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect end:

Note: None

Site: N2 - 1	**Date**: 17/4/2024	**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) 20			
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, Melia azedarach, Rhodosphaera rhodanthema (tulip satinwood)			
Native shrub species richness (50x10 m) 13			

Acacia maidenii (Maiden's wattle), Acacia fimbriata (Brisbane golden wattle), Glochidion ferdinandi, Mallotus philippensis (red kamala), Lomandra multiflora, Maclura cochinchinensis, Ficus coronata, Wikstroemia indica, Neolitsea dealbata, 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) 10	
Eustrephus latifolius (wombat berry), Dianella caerulea, Pteridium esculentum (common bracken), Doodia caudata, Stephania japonica, Lomandra hystrix, Geitonoplesium cymosum, Lomandra multiflora, Pandorea pandorana, Smilax australis	
Non-native plant cover (50x10 m): 65	
Coarse woody debris (50x20 m): 10	
Coarse woody debris lengths (m): 10,	
Quadrat 1	
Native perennial grass cover: 80	**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 2	
Native perennial grass cover: 50	**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: 70	**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 4	
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 5	
Native perennial grass cover: 10	**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

Notes:
Canopy: 52 m Details:
Sub-canopy: 72 m Details:
Shrub: 5 m Details:
Photos
Point: 152.62838810554535, -26.06946420504439
Photo North: 
Photo East: 
Photo South: 
Photo West:

Transect Start:

Transect End:

Note: None

Site: N3 - 1	**Date**: 16/4/2024	**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: 8		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 19			
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) 7			
Acacia disparrima subsp. disparrima, Lophostemon confertus (brush box), Eucalyptus sp1 (seedling), Acacia leiocalyx, Petalostigma pubescens, Alphitonia excelsa, Xanthorrhoea johnsonii			
Native grass species richness (50x10 m) 8			
Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Digitaria sp., Eragrostis sp., Oplismenus aemulus, Panicum effusum, Ottochloa gracillima, Eriachne sp.			
Native forbs/others species richness (50x10 m) 16			
Eustrephus latifolius (wombat berry), Lomandra longifolia, Desmodium rhytidophyllum, Dianella caerulea, Lomandra multiflora, Cyperus sp., Cayratia clematidea, Lepidosperma laterale, Trachymene sp., Coleus australis, Glycine sp., Fimbristylis vagans, Lobelia purpurascens, Brunoniella australis, Crotalaria montana, Flemingia parviflora			
Non-native plant cover (50x10 m): 70			
Coarse woody debris (50x20 m): 36			
Coarse woody debris lengths (m): 36			
Quadrat 1			
Native perennial grass cover: 0		**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 2			
Native perennial grass cover: 5		**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: 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:** 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: 35	**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
Notes:	
Canopy: 48 m Details:	
Sub-canopy: 3 m Details:	
Shrub: 17 m Details:	
Photos	
Point: 152.62172222826018, -26.070715336775695	
Photo North:	
Photo East:	
Photo South:	
Photo West:	
Transect Start: 	
Transect End:	

Note: None

Site: N3 - 2	**Date**: 17/4/2024		**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 torulosa, 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), Acacia maidenii (Maiden's wattle), Acacia leiocalyx, Acacia disparrima, Corymbia sp.			
Native grass species richness (50x10 m) 10			
Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Ottochloa gracillima (pademelon grass), Oplismenus aemulus, Cymbopogon refractus, Panicum effusum, Paspalidium sp., Digitaria parviflora, Microlaena stipoides, Eragrostis sp.			
Native forbs/others species richness (50x10 m) 25			
Lomandra multiflora, Lomandra confertifolia subsp. pallida, Eustrephus latifolius (wombat berry), Desmodium rhytidophyllum, Lobelia purpurascens, Flemingia parviflora, Glycine sp., Stephania japonica, Scleria sp., Carex inversa, Platycerium sp., Commelina diffusum, Cyanthillium cinerea, Sigesbeckia orientalis, Cyperus gracilis, Cheilanthes distans, Phyllanthus virgatus, Clematicissus opaca, Dianella sp., Lomandra multiflora, Lomandra confertifolia, Lomandra filiformis, Passiflora aurantia, Brunoniella australis			
Non-native plant cover (50x10 m): 29			
Coarse woody debris (50x20 m): 80			
Coarse woody debris lengths (m): 80			

Quadrat 1	
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 2	
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 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: 70	**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: 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: South West	**Transect length:** 100m
Notes:	
Canopy: 72 m Details:	
Sub-canopy: 38 m Details:	
Shrub: 19.5 m Details:	
Photos	
Point: 152.6285091525296, -26.07377064930418	
Photo North:	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N4 - 1	**Date**: 15/4/2024		**Recorder**: Peter Moonie
Locality/Land parcel: 889CP864404			**UIN**: 201006083637
GTRE: 12.9-10.17b			
Median tree canopy heights (m): **Emergent:** None	**Canopy:** 30		**Sub-canopy:** 13
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): 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) 13			
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, Acacia leiocalyx, Alphitonia excelsa, Acacia maidenii			
Native shrub species richness (50x10 m) 6			
Acacia disparrima subsp. disparrima, Eucalyptus siderophloia, Alphitonia excelsa (soap tree), Acacia leiocalyx, Corymbia tessellaris, Eucalyptus excelsa			
Native grass species richness (50x10 m) 9			
Entolasia stricta (wiry panic), Panicum effusum, Themeda triandra, Eragrostis sp., Digitaria parviflora, Alloteropsis semialata, Paspalidium distans, Aristida calycina, Microlaena stipoides			
Native forbs/others species richness (50x10 m) 18			
Sphaeromorphaea australis, Cyanthillium cinereum, Cheilanthes sieberiana, Lobelia purpurascens (white root), Lomandra longifolia, Goodenia rotundifolia, Dianella caerulea, Ghania aspera, Murdannia graminea, Cyperus sp. 1, Scleria sp., Hypoxis pratensis, Oldenlandia sp., Fimbristylis dichotoma, Commelina diffusa, Pigea stellarioides, Polygala sp., Lomandra multiflora			

Non-native plant cover (50x10 m): 30	
Coarse woody debris (50x20 m): 8	
Coarse woody debris lengths (m): 8 m	
Quadrat 1	
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 2	
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 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: 35	**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: 70	**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: West	**Transect length:** 100m
Notes: None	
Canopy: 38 m Details:	
Sub-canopy: 24 m Details:	
Shrub: 11.5 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**: 16/4/2024	**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 fores 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: 8		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 15			
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, Polyscias elegans, Psydrax odorata, Elaeocarpus obovata			
Native shrub species richness (50x10 m) 7			
Acacia leiocalyx, Lophostemon suaveolens (swamp box), Lophostemon confertus (brush box), Alphitonia excelsa (soap tree), Acacia disparrima subsp. disparrima , Eucalyptus sp. 1, Pittosporum revolutum			
Native grass species richness (50x10 m) 12			
Imperata cylindrica (blady grass), Entolasia stricta (wiry panic), Eragrostis spartinoides, Cymbopogon refractus (barbed-wire grass), Themeda triandra, Eriachne sp., Oplismenus aemulus, Ottochloa gracilis, Paspalidium sp., Digitaria parviflora, Panicum effusum, Aristida calycina			
Native forbs/others species richness (50x10 m) 21			
Lomandra confertifolia subsp. pallida, Eustrephus latifolius (wombat berry), Laxmannia gracilis (slender wire lily), Dianella caerulea, Lobelia purpurascens (white root), Geitonoplesium cymosum (scrambling lily), Desmodium rhytidophyllum, Lomandra filiformis, Cheilanthes sieberiana, Cyanthillium cinerea, Cymbopogon refractus, Glycine sp., Pimelea linifolia, Clematicissus opaca,			

Pandorea pandorana, Phyllanthus virgatus, Pigea stellarioides, Poranthera microphylla, Fimbristylis vaginata, Lomandra multiflora, Lomandra longifolia	
Non-native plant cover (50x10 m): 5	
Coarse woody debris (50x20 m): 57	
Coarse woody debris lengths (m): 57	
Quadrat 1	
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	
Quadrat 2	
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	
Quadrat 3	
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 4	
Native perennial grass cover: 40	**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: 15	**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: None	
Canopy: 58 m Details:	
Sub-canopy: 56 m Details:	
Shrub: 6.5 m	
Photos	
Point: 152.61074424324508, -26.06417295627528	

Photo North:
Photo East:
Photo South:
Photo West:
Transect Start: 
Transect End:
Note:

Site: N5 - 1	**Date**: 15/4/2024	**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: 6		**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) 9			
Acacia disparrima subsp. disparrima, Eucalyptus exerta, Cyclophyllum coprosmoides, Acacia leiocalyx, Alphitonia excelsa (soap tree), Corymbia citriodora (spotted gum), Solanum ellipticum, Lophostemon suaveolens, ficus rubiginosa			
Native grass species richness (50x10 m) 13			
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, Sporobolus sp.	
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, Pigea stellarioides, Cyperus sp. 1, Fimbristylis dichotoma, Cyperus sp. 2, Desmodium rhytidophyllum, Sphaeromorphaea australis, Glycine tabacina, Phyllanthus virgatus, Solanum gympiense, Solanum stelligerum, Desmodium gunnii, Polymeria calycina, Sigesbeckia orientalis, Scleria sp., Goodenia rotundifolia	
Non-native plant cover (50x10 m): 20	
Coarse woody debris (50x20 m): 38	
Coarse woody debris lengths (m): 38	
Quadrat 1	
Native perennial grass cover: 25	**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: 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 3	
Native perennial grass cover: 80	**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: 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 5	
Native perennial grass cover: 20	**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
Notes:	

Canopy: 22 m
Details:

Sub-canopy: 45.5 m
Details:

Shrub: 4 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**: 16/4/2024	**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:** 21 **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): 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) 15			
Corymbia intermedia (pink bloodwood), Eucalyptus acmenoides, Eucalyptus propinqua (small-fruited grey gum), Angophora leiocarpa (rusty gum), Eucalyptus siderophloia, 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 ,Melia azedarach			
Native shrub species richness (50x10 m) 6			

Alphitonia excelsa (soap tree), Eucalyptus propinqua, Acacia disparrima, Corymbia citriodora (spotted gum), Xanthorrhoea latifolia, Eucalyptus acmenoides	
Native grass species richness (50x10 m) 11	
Panicum effusum, Imperata cylindrica (blady grass), Cymbopogon refractus (barbed-wire grass), Entolasia stricta (wiry panic), Eriachne sp., Digitaria parviflora, Aristida calycina, Heteropogon contortus, Ottochloa gracillima, Eriachne sp., Alloteropsis semialata	
Native forbs/others species richness (50x10 m) 17	
Dianella brevipedunculata, Lomandra longifolia, Lomandra multiflora, Cyanthillium cinereum, Brunoniella australis, Desmodium rhytidophyllum, Gahnia aspera, Lomandra sp., Commelina diffusa (wandering jew), Cheilanthes sieberiana, Lobelia purpurascens, Cyperus sp. 1, Fimbristylis vagans, Glycine sp., Cyperus sp. 2, Crotalaria sp., Lomandra confertifolia	
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: 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: 10	**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: 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 4	
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 5	
Native perennial grass cover: 8	**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: North East	**Transect length:** 100m
Notes:	
Canopy: 54 m Details:	
Sub-canopy: 40 m Details:	
Shrub: 8 m Details:	
Photos	
Point: 152.6216846189632, -26.068683420836734	
Photo North: 	
Photo East: 	
Photo South: 	

Photo West:

Transect Start:

Transect End:

Note: None

Site: N6 - 2	**Date**: 16/4/2024	**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	**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: 5		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 14			
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), Petalostigma pubescens (quinine tree), Banksia integrifolia, Acacia maidenii (Maiden's wattle), Clerodendrum floribundum, Polyscias elegans			
Native shrub species richness (50x10 m) 9			
Acacia disparrima, Xanthorrhoea latifolia, Eucalyptus sp 1, Pimelea linifolia, Acacia leiocalyx, Styphelia juniperinus (prickly heath), Hibbertia sp., Alphitonia excelsa, Petalostigma pubescens			
Native grass species richness (50x10 m) 9			
Entolasia stricta (wiry panic), Imperata cylindrica (blady grass), Eriachne sp., Cymbopogon refractus (barbed-wire grass), Paspalidium distans, Eragrostis sp.1, Digitaria parvifolia, Eragrostis sp. 2, Eragrostis sp. 3			
Native forbs/others species richness (50x10 m) 12			
Lomandra longifolia, Laxmannia gracilis (slender wire lily) Dianella caerulea, Cyanthillium cinereum, Eustrephus latifolius (wombat berry), Dianella brevipedunculata, Poranthera microphylla (small poranthera), Lobelia purpurascens, Ottochloa gracillima, Lomandra sp., Brunoniella australis, Fimbristylis vaginata			
Non-native plant cover (50x10 m): 25			
Coarse woody debris (50x20 m): 15			
Coarse woody debris lengths (m): 15			
Quadrat 1			
Native perennial grass cover: 35		**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 2			
Native perennial grass cover: 8		**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: 3		**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:** 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: 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	
Transect	
Plot bearing: North West	**Transect length:** 100m
Notes:	
Canopy: 43 m Details:	
Sub-canopy: 71 m Details:	
Shrub: 7 m Details:	
Photos	
Point: 152.62400063908188, -26.070217738061817	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 1	**Date**: 15/4/2024	**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:** 8			
EDL:	**No. of dominant species in the EDL**: 5	**No. of dominant species in the EDL recruiting:** 4	**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: 4		**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, Eucalyptus sp. 1, Eucalyptus sp. 2, Corymbia citriodora			

Native grass species richness (50x10 m) 11	
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, Aristida queenslandica, Ottochloa gracillima	
Native forbs/others species richness (50x10 m) 21	
Desmodium rhytidophyllum, Dianella caerulea, Cyanthillium cinereum, Glycine sp, Lomandra confertifolia subsp. pallida, Lepidosperma laterale, Dianella caerulea, Parsonsia straminea (monkey rope), Goodenia rotundifolia, Eustrephus latifolius (wombat berry), Secamone elliptica, Passiflora aurantia, Pigea stellarioides, Hardenbergia violacea, Eremophila debilis, Lomandra multiflora, Lomandra filiformis, Sigesbeckia orientalis, Phyllanthus virgatus, Cheilanthes sieberi, Cyperus gracilis	
Non-native plant cover (50x10 m): 40	
Coarse woody debris (50x20 m): 75	
Coarse woody debris lengths (m): 60	
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: 15	**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: 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: 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: 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	

Transect	
Plot bearing: West	**Transect length:** 100m
Notes:	
Canopy: 22 m	
Sub-canopy: 65 m	
Shrub: 19 m Details:	
Photos	
Point: 152.6219363694197, -26.059450867144868	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 2a	**Date**: 17/4/2024	**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:** 9			
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) 7			
Lophostemon confertus (brush box), Acacia disparrima, Acacia maidenii (Maiden's wattle), Pandorea pandorana (wonga vine), Styphelia juniperinus (prickly heath), Maclura cochinchinensis (cockspur thorn), Ficus coronata			
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) 26			
Eustrephus latifolius (wombat berry), Lobelia purpurascens (white root), Desmodium rhytidophyllum, Cyperus indet, Sigesbeckia orientalis (Indian weed), Goodenia rotundifolia, Passiflora aurantia, Dianella caerulea, Eustrephus latifolius (wombat berry), Lomandra filiformis, Doodia caudata, Ajuga australis (Australian bugle), Lomandra confertifolia subsp. pallida, Viola hederacea, Brunoniella australis, Hardenbergia violacea, Commelina diffusa, Coleus australis, Desmodium gunnii, fern sp. 2, Glycine sp., Pigea stellarioides, Clematicissus opaca, Phyllurus virgatus, Gahnia aspera, Cyanthillium cinereum			
Non-native plant cover (50x10 m): 50			

Coarse woody debris (50x20 m): 41	
Coarse woody debris lengths (m): 41	
Quadrat 1	
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 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: 35	**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: 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 5	
Native perennial grass cover: 25	**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: South West	**Transect length:** 100m
Notes:	
Canopy: 33 m Details:	
Sub-canopy: 85 m Details:	
Shrub: 20 m Details:	
Photos	
Point: 152.6273964984509, -26.069369961579913	
Photo North:	

Photo East:

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: N7 - 3	**Date**: 17/4/2024	**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) 10			
Acacia leiocalyx, Styphelia juniperinus (prickly heath), Acacia disparrima subsp. disparrima, Eucalyptus sp 1. (seedling), Acacia fimbriata (Brisbane golden wattle), Alphitonia excelsa (soap tree), Lophostemon confertus, Acacia maidenii, Eucalyptus acmenoides, Eucalyptus siderophloia			
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, Panicum effusum, Chrysopogon filipes, Ottochloa gracillima, Capillipedium spicigerum			
Native forbs/others species richness (50x10 m) 16			
Lomandra confertifolia subsp. pallida, Cyanthillium cinereum, Desmodium rhytidophyllum, Glycine tabacina, Dianella caerulea, Eustrephus latifolius (wombat berry), Sigesbeckia orientalis, Lobelia purpurascens, Solanum gympiense, Artanema fimbriatum, Lomandra filiformis, Coleus australis, Brunoniella australis, Doodia caudata, Parsonsia straminea, Cyperus sp.			
Non-native plant cover (50x10 m): 30			
Coarse woody debris (50x20 m): 75			
Coarse woody debris lengths (m): 75			
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: 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 3			
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			
Quadrat 4			

Native perennial grass cover: 80	**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: 30	**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
Notes:	
Canopy: 24 m Details:	
Sub-canopy: 69 m Details:	
Shrub: 9 m Details:	
Photos	
Point: 152.63414383799764, -26.064502149600205	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: N8 - 1	**Date**: 15/4/2024		**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: 3		**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) 10			
Acacia disparrima subsp. disparrima, Corymbia citriodora, Daviesia ulicifolia, Xanthorrhoea johnsonii, Acacia leiocalyx, Styphelia juniperinus, Alphitonia excelsa (soap tree), Jacksonia scoparia, Eucalyptus acmenoides, Persoonia sericea,			
Native grass species richness (50x10 m) 9			
Panicum effusum, Entolasia stricta (wiry panic), Cymbopogon refractus (barbed-wire grass), Aristida calycina, Themeda triandra (kangaroo grass), Digitaria parviflora, Alloteropsis semialata, Eragrostis sp., Imperata cylindrica			
Native forbs/others species richness (50x10 m) 10			
Lomandra confertifolia subsp. pallida, Lomandra multiflora, Dianella caerulea, Desmodium rhytidophyllum, Glycine sp., Lobelia purpurascens, Eustrephus latifolius, Pigea stellarioides, Phyllanthus virgatus, Lomandra filiformis			
Non-native plant cover (50x10 m): 2			
Coarse woody debris (50x20 m): 2			
Coarse woody debris lengths (m): 2			
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: 10	**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: 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 4	
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 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
Notes:	
Canopy: Not present Details:	
Sub-canopy: 73 m Details:	
Shrub: 3.2 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**: 16/4/2024	**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:** N/A **Sub-canopy:** 7			
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) 7			
Acacia leiocalyx, Acacia disparrima, Melaleuca salicina, Lophostemon suaveolens (swamp box), Eucalyptus tereticornis, Eucalyptus propinqua, Corymbia intermedia			
Native shrub species richness (50x10 m) 6			

Eucalyptus tereticornis , Corymbia intermedia, Melaleuca quinquenervia, Lophostemon suaveolens, Eucalyptus propinqua, Acacia disparrima	
Native grass species richness (50x10 m) 4	
Imperata cylindrica (blady grass), Bothriochloa bladhii, Eragrostis sp., Digitaria sp.	
Native forbs/others species richness (50x10 m) 8	
Centella asiatica, Cyperus polystachyos, Fimbristylis dichotoma, Cyperus difformis, Glycine sp., Scleria sp., Carex inversa, Sacciolepis indica	
Non-native plant cover (50x10 m): 75	
Coarse woody debris (50x20 m): 0	
Coarse woody debris lengths (m): 0	
Quadrat 1	
Native perennial grass cover: 30	**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: 30	**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: 20	**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: 0	**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: 80	**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
Notes:	
Canopy: 0 m Details:	

Sub-canopy: 3 m
Details:

Shrub: 8 m
Details:

Photos

Point: 152.6335733283184, -26.06704200584743

Photo North:

Photo East:

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: C1 - 1	**Date**: 18/4/2024	**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:** 26	**Sub-canopy:** 11

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) 10			
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),			
Native shrub species richness (50x10 m) 4			
Acacia leiocalyx, Acacia disparrima, Alphitonia excelsa (soap tree), Glochidion ferdinandi			
Native grass species richness (50x10 m) 8			
Entolasia stricta (wiry panic), Themeda triandra (kangaroo grass), Cymbopogon refractus (barbed-wire grass), Ottochloa gracillima, Digitaria parviflora, Panicum effusum, Imperata cylindrica, Chrysopogon filipes			
Native forbs/others species richness (50x10 m) 14			
Dianella revoluta var. revoluta, Lomandra confertifolia subsp. pallida, Dianella caerulea, Lomandra filiformis, Eustrephus latifolius (wombat berry), Fimbristylis dichotoma, Marsdenia sp., Sida hackettiana, Zehneria cunninghamii, Sigesbeckia orientalis, Glycine sp., Cyperus sp., Polymeria calycina, Eremophila debilis			
Non-native plant cover (50x10 m): 10			
Coarse woody debris (50x20 m): 52			
Coarse woody debris lengths (m): 52			
Quadrat 1			
Native perennial grass cover: 15		**Organic litter cover:** 45	
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: 60		**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			
Quadrat 3			
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			
Quadrat 4			
Native perennial grass cover: 0		**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: 25	**Organic litter cover:** 25
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
Notes:	
Canopy: 55 m Details:	
Sub-canopy: 30 m Details:	
Shrub: 7 m Details:	
Photos	
Point: 152.677082740755, -26.1641134773285	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: None

Site: C1 - 2	**Date**: 18/4/2024	**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) 13			
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) 10			
Acacia disparrima, Acacia leiocalyx, Lophostemon suaveolens (swamp box), Corymbia citriodora, Lophostemon confertus (seedling), Myrsine angusta, Carissa ovata (currantbush), Eucalyptus moluccana, Eucalyptus propinqua, Eucalyptus acmenoides			
Native grass species richness (50x10 m) 7			
Entolasia stricta (wiry panic), Themeda triandra (kangaroo grass), Panicum effusum, Cymbopogon refractus (barbed-wire grass), Imperata cylindrica, Digitaria parviflora, Ottochloa gracillima			
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, Desmodium rhytidophyllum, Lobelia purpurascens, Glycine sp., Pigea stellarioides, Lomandra filiformis, Brunoniella australis			
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:** 8	

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: 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 4	
Native perennial grass cover: 85	**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: 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	
Transect	
Plot bearing: South East	**Transect length:** 100m
Notes:	
Canopy: 50 m Details:	
Sub-canopy: 21.5 m Details:	
Shrub: 11.5 m Details:	
Photos	
Point: 152.67782303448809, -26.15863571986914	
Photo North:	

Photo East:

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: C2 - 1	**Date**: 18/4/2024	**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:** 9			
EDL:	**No. of dominant species in the EDL**: 3	**No. of dominant species in the EDL recruiting:** 2	**Percentage recruiting:** 66.67

Number of large trees (100x50 m): 4	
Large eucalypt benchmark (DBH) value: 49	**Large non-eucalypt benchmark (DBH) value:** 36
Number of large eucalypt: 6	**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, Carissa ovata (currantbush), Styphelia juniperinus (prickly heath), Alphitonia excelsa (soap tree), Diospyros germinata, Polyscias elegans (celery wood), Psychotria daphnoides, Alchornea ilicifolia (native holly), Acalypha nemorum (hairy acalypha), Myrsine angusta, Pilidiostigma rhytispermum, Alyxia ruscifolia, Brachychiton acerifolius, Mallotus philippensis (red kamala), Cyclophyllum coprosmoides, Acacia oshanesii, Myrsine variabilis, Trema tomentosa, Lophostemon confertus, Pittosporum revolutum, Breynia oblongifolia, Cissus antarctica, Claoxylon australe, Tragia novae-hollandiae	
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	
Dianella caerulea, Lomandra longifolia, Cissus antarctica, Smilax australis (barbed-wire vine), Geitonoplesium cymosum (scrambling lily), Cyanthillium cinereum, Eustrephus latifolius (wombat berry), Lobelia purpurascens, Cayratia clematidea, Pigea stellarioides, Lomandra hystrix, Passiflora aurantia, Clematicissus opaca	
Non-native plant cover (50x10 m): 35	
Coarse woody debris (50x20 m): 25	
Coarse woody debris lengths (m): 25	
Quadrat 1	
Native perennial grass cover: 50	**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: 80	**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: 40	**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: 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: 70	**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 East	**Transect length:** 100m
Notes: 12.3.11	
Canopy: 82 m Details:	
Sub-canopy: 69 m Details:	
Shrub: 15.5 m Details:	
Photos	
Point: 152.68337218348276, -26.155875962085503	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: S1 - 1	**Date**: 18/4/2024	**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) 16			
Cyclophyllum coprosmoides, Acacia disparrima, Cryptocarya triplinervis, Alphitonia excelsa (soap tree), Psychotria daphnoides, Lophostemon suaveolens (swamp box), Maclura cochinchinensis (cockspur thorn), Cupaniopsis parvifolia (small-leaved tuckeroo), Streblus brunonianus (whalebone tree), Aphananthe philippinensis, Carissa ovata (currantbush), Breynia oblongifolia, Tabernaemontana pandacaqui, Pittosporum revolutum, Brachychiton acerifolius, Embelia australiana			
Native grass species richness (50x10 m) 3			
Imperata cylindrica (blady grass), Paspalidium distans, Panicum sp.			
Native forbs/others species richness (50x10 m) 10			
Lomandra longifolia, Dianella caerulea, Smilax australis (barbed-wire vine), Eustrephus latifolius (wombat berry), Gahnia aspera, Geitonoplesium cymosum, Pigea stellarioides, Cayratia clematidea, Lomandra hystrix, Stephania japonica			
Non-native plant cover (50x10 m): 5			
Coarse woody debris (50x20 m): 16			
Coarse woody debris lengths (m): 6			
Quadrat 1			

Native perennial grass cover: 25	**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: 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 3	
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 4	
Native perennial grass cover: 30	**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: 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: West	**Transect length:** 100m
Notes:	
Canopy: 61 m Details:	
Sub-canopy: 86 m Details:	
Shrub: 12 m Details:	
Photos	
Point: 152.70189262021674, -26.23822312068297	
Photo North:	

Photo East:

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: S2 - 1	**Date**: 19/4/2024		**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:** 66.67
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) 30			
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, Alyxia ruscifolia, Leucopogon juniperinus (prickly heath), Denhamia bilocularis, Myrsine variabilis, Alectryon reticulatis, Jagera pseudorhus, 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 acorifolia, Alphitonia excelsa, Claoxylon australe	
Native shrub species richness (50x10 m) 27	
Alyxia ruscifolia, Acacia disparrima subsp. disparrima, Denhamia bilocularis, Acacia complanata (flatstem wattle), Cyclophyllum coprosmoides, Carissa ovata (currantbush), Tabernaemontana pandacaqui (banana bush), Cyclophyllum coprosmoides, Solanum stelligerum (devil's needles), Cupaniopsis parvifolia (small-leaved tuckeroo), Myrsine variabilis, Styphelia juniperinus (prickly heath), Diospyros germinata, Petalostigma triloculare, Alphitonia excelsa, Melicope micrococca, Eucalyptus sp., Everistia vacciniifolia, Pavetta australis, Trema tomentosa, Psychotria daphnoides, Jagera pseudorhus, Zieria minutiflora, Guioa semiglauca, Mischocarpus pyriformis, Lophostemon suaveolens, Claoxylon australe	
Native grass species richness (50x10 m) 5	
Enteropogon sp., Ottochloa gracillima, Chrysopogon filipes, Digitaria parviflora, Oplismenus aemulus	
Native forbs/others species richness (50x10 m) 12	
Dianella caerulea, Lomandra multiflora, Lomandra confertifolia subsp. pallida, Dianella caerulea, Smilax australis (barbed-wire vine), Pseuderanthemum variable, Pigea stellarioides, Cyanthillium cinereum, Solanum gympiense, Gahnia aspera, Passiflora aurantia, Eustrephus latifolius	
Non-native plant cover (50x10 m): 12	
Coarse woody debris (50x20 m): 135	
Coarse woody debris lengths (m): 135	
Quadrat 1	
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 2	
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 3	
Native perennial grass cover: 30	**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: 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 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: North East	**Transect length:** 100m
Notes:	
Canopy: 46 m Details:	
Sub-canopy: 72 m Details:	
Shrub: 8 m Details:	
Photos	
Point: 152.70305455220608, -26.24031949056037	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note: None

Site: S2 - 2	**Date**: 19/4/2024	**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) 24			
Alyxia ruscifolia, Denhamia bilocularis, Carissa ovata (currantbush), Cupaniopsis parvifolia (small-leaved tuckeroo), Elaedendron australe, Myrsine variabilis, Acacia disparrima, Mallotus philippensis (red kamala), Cryptocarya triplinervis, Tabernaemontana pandacaqui (banana bush), Polyscias elegans (celery wood), Cyclophyllum coprosmoides, Flindersia schottiana, Alphitonia excelsa (soap tree), Lophostemon suaveolens (swamp box), Eucalyptus sp., Aphananthe philippinensis, Psychotria daphnoides, Pavetta australiensis, Pittosporum revolutum, Trophis scandens, Hibiscus heterophyllus, Jasminum simplicifolium, Claoxylon austale			
Native grass species richness (50x10 m) 6			
Enteropogon entunis, Oplismenus aemulus, Cymbopogon refractus, Imperata cylindrica, Ottochloa gracillima, Paspalidium sp.			
Native forbs/others species richness (50x10 m) 15			

Smilax australis (barbed-wire vine), Gahnia aspera, Geitonoplesium cymosum (scrambling lily), Dianella caerulea, Lomandra filiformis, Trophis scandens, Cyperus sp. 1, Cyanthillium cinereum, Doodia caudata, Pandorea pandorana, Lobelia purpurascens, Pigea stellarioides, Marsdenia coronata, Solanum stelligerum, Parsonsia straminea	
Non-native plant cover (50x10 m): 25	
Coarse woody debris (50x20 m): 68	
Coarse woody debris lengths (m): 68	
Quadrat 1	
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 2	
Native perennial grass cover: 65	**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: 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 4	
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	
Quadrat 5	
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	
Transect	
Plot bearing: North West	**Transect length:** 100m
Notes:	
Canopy: 52 m Details:	
Sub-canopy: 81 m Details:	
Shrub: 38 m	

Details:
Photos
Point: 152.7017619512238, -26.241598040828517
Photo North:
Photo East:
Photo South:
Photo West:
Transect Start: 
Transect End:
Note: None

Site: S3 - 1	**Date**: 19/4/2024	**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:** 14			
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): 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) 9			

Acacia disparrima, Carissa ovata (currantbush), Styphelia juniperinus (prickly heath), Acacia maidenii (Maiden's wattle), Eucalyptus sp., Alphitonia excelsa, Corymbia citriodora, Pavetta australiensis , Alchornea ilicifolia	
Native grass species richness (50x10 m) 12	
Themeda triandra (kangaroo grass), Aristida calycina, Entolasia stricta (wiry panic), Enteropogon sp., Cymbopogon refractus (barbed-wire grass), Panicum effusum, Digitaria parviflora, Ottochloa gracillima, Paspalidium distans, Dinebra decipiens, Chrysopogon filipes, Aristida sp. 2	
Native forbs/others species richness (50x10 m) 14	
Dianella caerulea, Lomandra filiformis, Desmodium rhytidophyllum, Gahnia aspera, Cyanthillium cinereum, Lepidosperma laterale, Sigesbeckia orientalis, Cyperus gracilis, Lomandra multiflora, Glycine sp., Lobelia purpurascens, Pigea stellarioides, Eustrephus latifolius, Pseuderanthemum variable	
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: 60	**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: 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 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: 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	
Quadrat 5	
Native perennial grass cover: 10	**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: West	**Transect length:** 100m
Notes:	
Canopy: 46 m Details:	
Sub-canopy: 81 m Details:	
Shrub: 7 m Details:	
Photos	
Point: 152.71119129711295, -26.245811893941255	
Photo North: 	
Photo East: 	
Photo South:	

Photo West:

Transect Start:

Transect End:

Note:

Site: S4 - 1	**Date**: 19/4/2024	**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) 24			
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, Styphelia juniperinus (prickly heath), Psychotria daphnoides, Cyclophyllum coprosmoides, Diospyros geminata, Myrsine angulata, Astrotricha latifolia, Pavetta australiensis, Hibiscus heterophyllus, Pittosporum revolutum, Zieria smithii			
Native grass species richness (50x10 m) 2			
Entolasia stricta (wiry panic), Ottochloa gracillima			
Native forbs/others species richness (50x10 m) 22			
Dianella caerulea, Lomandra confertifolia subsp. pallida, Lepidosperma laterale, Solanum gympiense, Marsdenia coronata (slender milkvine), Eustrephus latifolius (wombat berry), Smilax australis (barbed-wire vine), Gahnia aspera, Desmodium rhytidophyllum, Lobelia purpurascens, Clematicissus opaca, Pigea stellarioides, Pandorea pandorana, Pseuderanthemum variable, Cyanthillium cinerea, Geitonoplesium cymosum, Tragia novae-hollandiae, Brunoniella australis, Melodorum leichhardtii, Desmodium gunnii, Lomandra hystrix, Dioscorea transversa			
Non-native plant cover (50x10 m): 30			
Coarse woody debris (50x20 m): 49			
Coarse woody debris lengths (m): 49,			
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: 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: 30	**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: 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: 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	
Transect	
Plot bearing: North East	**Transect length:** 100m
Notes:	
Canopy: 76 m Details:	
Sub-canopy: 68 m Details:	
Shrub: 26 m Details:	
Photos	
Point: 152.7109043409516, -26.24734729848676	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: S4 - 2	**Date**: 20/4/2024	**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: 4		**Number of large non-eucalypt:** 0	
Native tree species richness (100x50 m) 30			
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) 20			
Acacia disparrima, Acacia oshanesii, Carissa ovata (currantbush), Alyxia ruscifolia, Denhamia bilocularis, Alphitonia excelsa (soap tree), Cyclophyllum coprosmoides, Citrus australis, Polyscias elegans (celery wood), Cupaniopsis parvifolia (small-leaved tuckeroo), Jagera pseudorhus, Solanum stelligerum, Mallotus philippensis, Rhodosphaera rhodanthema, Hibiscus Heterophylla, Psychotria daphnoides, Pavetta australiensis, Tabernaemontana pandacaqui, Achyranthes aspera, Alectryon connatus			
Native grass species richness (50x10 m) 3			
Ottochloa gracillima, Oplismenus aemulus, Enteropogon unispiceus			
Native forbs/others species richness (50x10 m) 15			

Dianella caerulea, Gahnia aspera, Eustrephus latifolius (wombat berry), Marsdenia lloydii, Smilax australis (barbed-wire vine), Pleogyne australis, Geitonoplesium cymosum (scrambling lily), Cayratia clematidea, Marsdenia coronata, Cyperus gracillis, Achyranthes aspera, Abutilon oxycarpum, Coleus australis, Desmodium rhytidophyllum, Pigea stellarioides	
Non-native plant cover (50x10 m): 70	
Coarse woody debris (50x20 m): 114	
Coarse woody debris lengths (m): 114	
Quadrat 1	
Native perennial grass cover: 10	**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: 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: 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: 2	**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: 0	**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: North West	**Transect length:** 100m
Notes:	
Canopy: 39 m Details:	
Sub-canopy: 63 m Details:	
Shrub: 9.2 m	

Details:

Photos

Point: 152.71137124326978, -26.249486009937343

Photo North:

Photo East:

Photo South:

Photo West:

Transect Start:

Transect End:

Note:

Site: S4 - 3	**Date**: 20/4/2024	**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: 3		**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) 25			
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, Lophostemon confertus, Pavetta australiana, Alphitonia excelsa, Myrsine variabilis, Polyscias elegans, Drypetes deplanchei, Guioa semiglauca, Hibiscus heterophyllus, Acronychia laevis, Arytera distylis, Citrus australis, Jagera pseudorhus, Tabernaemontana pandacaqui, Claoxylon australe, Mallotus philippensis, Acacia maidenii			
Native grass species richness (50x10 m) 7			
Cymbopogon refractus (barbed-wire grass), Imperata cylindrica (blady grass), Aristida sp., Digitaria parviflora, Ottochloa gracillima, Dinebra decipiens, Paspalidium sp.			
Native forbs/others species richness (50x10 m) 15			
Smilax australis (barbed-wire vine), Lomandra longifolia, Secamone elliptica, Gahnia aspera, Dianella caerulea, Sigesbeckia orientalis, Abutilon oxycarpum, Cyanthillium cinerea, Pandorea pandorana, Dioscorea transversa, Pseuderanthemum variable, Pigea stellarioides, Cyperus sp., Cayratia clematidea, Parsonsia langiana			
Non-native plant cover (50x10 m): 25			
Coarse woody debris (50x20 m): 103			
Coarse woody debris lengths (m): 103			
Quadrat 1			
Native perennial grass cover: 10		**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 2			
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 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: 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: 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	
Transect	
Plot bearing: North East	**Transect length:** 100m
Notes:	
Canopy: 72 m Details:	
Sub-canopy: 59 m Details:	
Shrub: 18 m Details:	
Photos	
Point: 152.71301166997873, -26.25167578045187	
Photo North: 	
Photo East:	

Photo South:

Photo West:

Transect Start:

Transect End:

Note: None

Site: S5 - 1	**Date**: 19/4/2024	**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) 10			

Acacia disparrima, Grewia latifolia (dysentery plant), Leucopogon juniperinus (prickly heath), Eucalyptus sp1. (seedling), Alphitonia excelsa (soap tree), Acacia leiocalyx, Cupaniopsis parvifolia (small-leaved tuckeroo, Acacia penninervis, Corymbia citriodora, Trema tomentosa	
Native grass species richness (50x10 m) 11	
Cymbopogon refractus (barbed-wire grass), Aristida sp1., Aristida sp. 2, Entolasia stricta (wiry panic), Ottochloa gracillima, Digitaria parviflora, Enteropogon acicularis, Imperata cylindrica, Paspalidium sp., Eragrostis sp., Dinebra decipiens	
Native forbs/others species richness (50x10 m) 8	
Dianella caerulea, Solanum gympiense, Cyanthillium cinerea, Cyperus sp. 2, Desmodium rhytidophyllum, Sigesbeckia orientalis, Achyranthes aspera, Glycine sp.	
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: 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 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: 0	**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 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: 2	**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: East	**Transect length:** 100m

Notes:
Canopy: 41 m Details:
Sub-canopy: 62 m Details:
Shrub: 25 m Details:
Photos
Point: 152.71017906569563, -26.244336692029147
Photo North: 
Photo East: 
Photo South: 
Photo West:

Transect Start:

Transect End:

Note:

Site: S7 - 1	**Date**: 18/4/2024	**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:** 23	**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) 21			
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, Psydrax odorata			
Native shrub species richness (50x10 m) 22			
Lophostemon suaveolens (swamp box), Maclura cochinchinensis (cockspur thorn), Cupaniopsis parvifolia (small-leaved tuckeroo), Diospyros germinata, Carissa ovata (currantbush), Alphitonia excelsa (soap tree), Psychotria daphnoides, Aphananthe philippinensis, Alyxia ruscifolia, Cryptocarya triplinervis, Acacia disparrima, Cyclophyllum coprosmoides, Myrsine variabilis, Polyscias elegans (celery wood), Grevillea robusta, Glochidion ferdinandi, Jagera pseudorhus, Clerodendrum floribundum, Lophostemon suaveolens, Corymbia sp., Tabernaemontana pandacaqui, Breynia oblongifolia			
Native grass species richness (50x10 m) 4			
Imperata cylindrica (blady grass), Ottochloa gracillima, Oplismenus aemulus, Chrysopogon filipes			
Native forbs/others species richness (50x10 m) 17			
Dianella caerulea, Lomandra longifolia, Eustrephus latifolius (wombat berry), Smilax australis (barbed-wire vine), Parsonsia straminea (monkey rope), Geitonoplesium cymosum (scrambling lily), Gahnia aspera, Cyperus sp., Stephania japonica, Lomandra hystrix, Passiflora aurantia, Marsdenia coronata, Pigea stellarioides, Ipomoea sp., Sigesbeckia orientalis, Pandorea pandorana, Cayratia clematidea			
Non-native plant cover (50x10 m): 2			
Coarse woody debris (50x20 m): 28			
Coarse woody debris lengths (m): 28			
Quadrat 1			
Native perennial grass cover: 10		**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: 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: 70		**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: 25	**Organic litter cover:** 55
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:** 82
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
Notes:	
Canopy: 42 m Details:	
Sub-canopy: 75 m Details:	
Shrub: 19 m Details:	
Photos	
Point: 152.70011386332777, -26.238455198703974	
Photo North:	
Photo East:	
Photo South:	
Photo West:	
Transect Start: 	

Transect End:
Note:

Appendix D

Weed density comparison 2020 vs 2022 vs 2024

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Combined cover 2024 (%)	Change from 2020 to 2024 (percentage points)
N7-2	21.0 	21.0 	36.0 	71.4
N7-4	45.0 	63.0 	95.0 	111.1

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Combined cover 2024 (%)	Change from 2020 to 2024 (percentage points)
S3-1	30.0 	42.0 	98.0 	226.7
C1-4	80.0 	9.0 	2.0 	-97.5

Quadrat	Combined cover 2020 (%)	Combined cover 2022 (%)	Combined cover 2024 (%)	Change from 2020 to 2024 (percentage points)
N5-1	50.0 	42.5 	1.0 	-98.0
N8-1	31.0 	21.0 	0.3 	-99.0

ghd.com

The Power of Commitment