

Attachment A9

Offset Management Plan



Offset Management Plan (EPBC 2021/9070)

Hayfield School Site, Fischer Road, Ripley, Queensland
(Willowvale Offset Property Offset Area)

Prepared for Jolifields Development Pty Ltd & The Trustee for Morehampton
Capital & Trustee for the Goldfields QLD Trust and Upscale Capital Pty Ltd ATF
Koala Farmland Fund 2 as the offset provider

17 August 2026

**Saunders
Havill**

PATHWAYS TO SUCCESS

Document Information

This Offset Management Plan (EPBC 2020/8791) has been prepared by Saunders Havill on behalf of the proponent Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust and Upscale Capital Pty Ltd ATF Koala Farmland Fund 2 as the offset provider, dated 17 August 2026.

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Version D	17.08.2026	TC	AD



Executive Summary

Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust, the proponent, has engaged Upscale Capital Pty Ltd ATF Koala Farmland Fund 2 as the offset provider to coordinate and deliver a biodiversity offset to compensate for significant impacts to Matters of National Environmental Significance (MNES) as part of the proposed residential development at their Hayfield School Site, Fischer Road, Ripley, Queensland (herein referred to as the Project). The Project was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) (EPBC 2021/9070). The Department of Climate Change, Energy, the Environment and Water (DCCEEW) has assessed that biodiversity offsets are required for *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox).

The purpose of this Offset Management Plan (OMP) is to provide the objectives, key commitments including milestones and measurables (performance targets) and completion criteria necessary to fulfil a statutory requirement for the provision of an offset for Koala (*Phascolarctos cinereus*) and Grey-headed Flying-fox (*Pteropus poliocephalus*) under the EPBC Act.

Habitat quality of the impact area and offset area were quantified utilising the respective Modified Habitat Quality Assessment (MHQA) methods for koala and grey-headed flying-fox Foraging Habitat Assessment (FHA) method in addition to other baseline surveys including preliminary motion-triggered camera monitoring and foraging and habitat tree plotting. Baseline habitat quality metrics and scores for the offset area were established and they form the basis for proposed increases to be achieved as part of the offset delivery. These are summarised in **Table ES1** below.

Seven management actions are proposed to deliver the offset and proposed environmental outcomes over a 20-year period which includes proposed actions, completion criteria and monitoring actions. The management actions are:

1. Legally secure offset area,
2. Non-Native Vertebrate Pest Management,
3. Management of Weeds of National Significance,
4. Develop and implement Bushfire Management Plan,
5. Habitat Creation and Regeneration,
6. Fencing and signage,

Interim milestone targets have been created for proposed environmental outcomes for each MNES to provide an indication of the relative success of management measures. A monitoring and reporting schedule has been prepared to assist in achieving these outcomes. Additionally, an adaptive management framework and corrective action triggers are proposed whereby it is demonstrated that management measures are not effective in achieving results.



Overall, the proposed offset is considered suitable for the proposed residual impacts on MNES based on an offset suitability analysis, proposed management framework and scale of offset area. The proposed offset area achieves,

- **151.94%** of the required offset for Koala,
- **170.73%** for Grey-headed Flying-fox.

Table ES1: Offset area MNES habitat quality baseline and future scores – summary

AU	Area (ha)	Koala Habitat Quality Score		GHFF Habitat Quality Score	
		Baseline	Future	Baseline	Future
1	36.3	5.40	7.13	4.25	7.00
2	50.5	5.46	7.13	4.41	7.00
3	14.0	5.99	7.45	5.63	6.86



Table of Contents

1. Introduction	1
1.1. Background	1
1.2. Purpose of the Management Plan	2
1.3. Report Structure	2
2. Roles and Responsibilities	3
3. Overview of Impact Area	4
3.1. Project and Site	4
3.2. Summary of Matters Requiring Offset	8
3.2.1 Vegetation communities impacted	8
3.3. Habitat Quality Scoring Methods and Results	9
3.3.1 Koala – Modified Habitat Quality Assessment (MHQA)	9
3.3.2 Koala Discussion	32
3.3.3 Grey-headed Flying Fox – Foraging Habitat Assessment Tool	34
3.3.4 Grey-headed Flying-fox Discussion	43
4. Overview of Offset Area	44
4.1. Offset Property Description and Tenure	44
5. Offset Area Suitability	50
5.1. Bioregional Context	50
5.2. Offset Area Values	50
5.2.1 Regional and landscape context	50
5.2.2 Topography	51
5.2.3 Water resources	51
5.2.4 MNES habitat	51
5.2.5 Current management arrangement	52
5.2.6 Current threats	52
5.3. Suitability Analysis – Environmental Offset Policy	56
5.3.1 Recovery plans and advice	61
6. Baseline Surveys	66
6.1. Offset Area Baseline Surveys – Methodology	66
6.1.1 Habitat - MNES	66
6.1.2 Koala – Modified Habitat Quality Assessment (MHQA)	67
6.1.3 Grey-headed Flying-fox – Foraging Assessment Tool	72



6.1.4	Spot Assessment Technique surveys	74
6.1.5	Motion-triggered camera trapping	74
6.1.6	Relative Abundance Index	76
6.1.7	Weed mapping	77
6.2.	Offset Area Baseline Assessment Results	78
6.2.1	Assessment unit descriptions	78
6.2.2	Koala Discussion	80
6.2.3	Grey-headed Flying-Fox Discussion	88
6.2.4	Non-native vertebrate pest abundance survey	89
6.2.5	Weeds Mapping	90
6.2.6	Summary of baseline scores for offset area	93
7.	Environmental Outcomes	94
7.1.	Koala	94
7.2.	Grey-headed Flying-fox	95
7.3.	Offset Assessment Guide – Calculator	95
7.3.1	Completion criteria	96
8.	Monitoring and Reporting Schedule	101
9.	Management Framework	106
9.1.	Management Approach	106
9.2.	Operational Management Units	106
9.3.	Management Action 1 – Legally Secure Offset Area	107
9.4.	Management Action 2 – Non-native Vertebrate Pest Management	107
9.4.1	Justification	107
9.4.2	Baseline surveys	108
9.4.3	Proposed action and management measures	109
9.4.4	Adaptive management for non-native predator species	112
9.4.5	Milestone monitoring	112
9.5.	Management Action 3 – Management of Weeds	113
9.5.1	Justification	113
9.5.2	Proposed action	114
9.5.4	Milestone monitoring	121
9.6.	Management Action 4 – Bushfire Management Plan	122
9.6.1	Justification	122
9.6.2	Proposed action and management measures	122
9.6.3	Monitoring and reporting	126
9.7.	Management Action 5 – Habitat creation and regeneration	127
9.7.1	Justification	127
9.7.2	Management actions	127



9.7.3	Rehabilitation methodology	130
9.7.4	Annual monitoring and reporting	134
9.7.5	Milestone monitoring	135
9.8.	Management Action 6 – Fencing and Signage	135
9.9.	Reporting requirements	136
9.10.	Data Management	137
10.	Adaptive Management	138
10.1.	Uncertainty	138
10.1.1	Regulatory and policy context	139
10.2.	Risk of Failure	139
10.3.	Limitations	145
11.	References	146
12.	Appendices	149



Tables

Table 1:	Key personnel	3
Table 2:	Details of impact area	4
Table 3:	Mapped regional ecosystem present within MNES impact site.	8
Table 4:	Koala site condition scoring attributes (BioCondition Manual)	14
Table 5:	Koala Threat Scoring Matrix	21
Table 6:	Species Mobility Scoring Categories	22
Table 7:	Restrictions to Dispersal	23
Table 8:	Mobility Reduction Guideline	24
Table 9:	Koala Species Stocking Rate Scoring	26
Table 10:	Summary of assessment units and MHQA transects – impact site	27
Table 11:	Impact site Koala MHQA final weighted score summary	32
Table 12:	GHFF FHA Vegetation Condition Scoring	36
Table 13:	GHFF FHA Species Richness Scoring	36
Table 14:	GHFF FHA Flower Score (average) Scoring	36
Table 15:	GHFF FHA Timing of Biological Shortages Scoring	37
Table 16:	GHFF FHA Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring	37
Table 17:	GHFF FHA Non-Native Plant Cover Scoring	37
Table 18:	GHFF FHA Size of Patch Scoring	39
Table 19:	GHFF FHA Connectedness Scoring	39
Table 20:	GHFF FHA Context Scoring	39
Table 21:	GHFF FHA Ecological Corridors Scoring	39
Table 22:	GHFF FHA Threats to Species Scoring	40
Table 23:	GHFF FHA Role of Site Location to Species Overall Population Scoring	40
Table 24:	GHFF Species Stocking Rate Scoring	40
Table 25:	Impact area grey-headed flying-fox – FHA assessment summary	43
Table 26:	Willowvale Offset Area summary	44
Table 27:	Regional ecosystem descriptions	51
Table 28:	Offset suitability analysis – Environmental Offsets Policy	56
Table 29:	Offset area baseline field surveys methods summary	66
Table 30:	Summary of assessment units and MHQA transects – offset area	67
Table 31:	Fauna camera summary (21 st August to 9 th September 2025)	75
Table 32:	Site condition scores for offset area assessment units	80
Table 33:	Koala site context scores for offset area	81
Table 34:	Offset Site Foraging Habitat Assessment	83
Table 35:	Offset Site Shelter Habitat Assessment	83
Table 36:	Offset Site Threats Assessment	84
Table 37:	Offset Site Mobility Assessment	85
Table 38:	Baseline SAT survey results	87
Table 39:	Koala species stocking rate scores within offset area assessment units.	87
Table 40:	Summary of Non-native pest survey results	89



Table 41:	Weed coverage transects summary	90
Table 42:	Offset area MHQA score summary – Koala	93
Table 43:	Offset area FHA score summary – Grey-headed Flying-fox	93
Table 44:	Koala baseline MHQA and offset improvement scores	94
Table 45:	GHFF baseline FHA and offset improvement scores	95
Table 46:	Summary of Koala offset compensation	95
Table 47:	Summary of GHFF offset compensation	96
Table 48:	Completion criteria and performance targets	98
Table 49:	Timeline for monitoring and reporting actions	101
Table 50:	Offset area operational management units	106
Table 51:	<i>Predator species management priorities</i>	108
Table 52:	Predator species control methods - adapted from Wool Producers Australia 2014	110
Table 53:	Lantana management methods	114
Table 54:	Weed treatment and removal methods	115
Table 55:	<i>Weed treatment schedules (source: SEQERF)</i>	118
Table 56:	Operational management unit rehabilitation method summary	128
Table 57:	Risk of failure table and corrective actions	140



Figures

Figure 1:	Impact Site Context	5
Figure 2:	Impact Site Aerial	6
Figure 3:	Offset Site Context	46
Figure 4:	Offset Site Aerial	47

Plans

Plan 1:	Impact Site Development Footprint and MNES Habitat	7
Plan 2:	Impact Site AUs and MHQA Transect Locations	28
Plan 3:	Impact Site Koala Context Assessment	29
Plan 4:	Koala Threats Analysis	30
Plan 5:	Impact Site Ecological Corridors	31
Plan 6:	Impact Site GHFF Context Assessment	42
Plan 7:	Offset Area Context	48
Plan 8:	Offset Area Historical Aerial Imagery	49
Plan 9:	Offset Area Biodiversity Corridors	54
Plan 10:	Offset Area Topography	55
Plan 11:	Offset Area Assessment Units	68
Plan 12:	Offset Area Baseline Field Survey Effort	69
Plan 13:	Offset Area Koala Context Assessment	70
Plan 14:	Offset Area Koala Threats Assessment	71
Plan 15:	Offset Area GHFF Context Assessment	73
Plan 16:	Offset Area Baseline Weed Mapping Results	91
Plan 17:	Offset Area Operations Management Units and Rehabilitation Areas	129



Acronyms

ACR	Annual Compliance Report
ATF	As Trustee For
AU	Assessment Unit
BMP	Bushfire Management Plan
DAWE	Department of Agriculture, Water and Environment (Commonwealth, former)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DEHP	Department of Heritage and Protection (Qld, former)
DETSI	Department of Environment, Tourism, Science and innovation
EDL	Ecologically Dominant Layer
EOP	EPBC Act Environmental Offset Policy (2012)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GPS	Global Positioning System
ha	hectare
KFF	Koala Farmland Fund
km	kilometres
LGA	Local Government Area
m	metre
MHQA	Modified Habitat Quality Assessment
mm	millimetres
MNES	Matters of National Environmental Significance
OAG	Offset Assessment Guide
OAAR	Offset Area Annual Report
OMP	Offset Management Plan
OMU	Operational Management Unit
QI	Quantum Impact
RAI	Relative Abundance Index
RE	Regional Ecosystem
RVPDA	Ripley Valley Priority Development Area
SAT	Spot Assessment Technique
SEQ	South East Queensland
SEQERF	Southeast Queensland Ecological Restoration Framework
SPP	Used when referring to multiple species within a genus
SRC	Somerset Regional Council
SSR	Species Stocking Rate
VDEC	Voluntary Declaration
VMA	<i>Vegetation Management Act 1999</i>
WONS	Weeds of National Significance



Definitions

Proponent – Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust

Offset Provider – Upscale Capital Pty Ltd ATF Koala Farmland Fund 2

Impact area – The area where clearing will occur. This is located at Lot 901 on SP 335423.

Milestone Report – A report prepared by a suitably qualified person before the end of Years 5, 10, 15 and 20 of the offset assessing against the interim milestone achievements and completion criteria.

Offset area – The 100 ha area within the offset property where the specific offset will be implemented and consists of three (3) assessment units.

Offset property – Means the broader 'Willowvale Offset Property,' Esk Crows Nest Road, Biarra Qld 4313.

Year 1 of the offset: the 12 month period following legal securement of the offset area.

Years 2 to 20 of the offset – The 12-month period following each anniversary of the legal securement of the offset area.



Declaration of Accuracy

In making this declaration, I am aware that section 491 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

Full name

Position

Organisation

Date

Offset Provider Consent

The Offset Provider agrees to the offset being undertaken over the land identified in Section 6 of this Offset Management Plan, and in the manner outlined in Section 9.

Signed

Full name

Rob Martyn

Position

Offset Provider

Organisation

Upscale Capital Pty Ltd ATF Koala Farmland Fund 2

Date



1. Introduction

1.1. Background

Saunders Havill (SH) have prepared this Offset Management Plan (OMP) on behalf of the proponent, Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust, to be implemented by the offset provider, Koala Farmland Fund (KFF), in accordance with the Preliminary Documentation Request provided for EPBC Act Application 2021/9070. The OMP has been prepared to address impacts associated with the proposed construction of educational facilities on land located at Fischer Road, Ripely (Lot 901 on SP 335423) ('impact site'). The impact site requires all vegetation within the referral area to be cleared to deliver a level development pad to Education Queensland. The area was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and subsequently declared a "Controlled Action" on 25th November 2021, requiring assessment by "Preliminary Documentation" pursuant to section 18 and 18A (listed threatened species and communities) (EPBC 2021/9070).

As part of the Preliminary Documentation requirements, a proposal was developed to compensate for the unavoidable impacts from minimised clearing of 19.1 ha of Koala (*Phascolarctos cinereus*) habitat as well as being considered by the Department (Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)) as potential Grey-headed Flying-fox (*Pteropus poliocephalus*) foraging habitat. Through detailed analysis within the Preliminary Documentation and DCCEEW assessment it was determined that a significant residual impact on these species was likely relative to others, such as Greater Glider (*Petauroides volans*), Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera Phrygia*) that will not be impacted.

The Proponent will deliver the overall 'conservation gain' for Koala and Grey-headed Flying-fox as part of a single site offset solution positioned within the south-eastern portion of the wider KFF Willowvale Offset Property (referred to as the 'offset property'), which contains a range of approved Federal offsets for the Koala and other species managed by the Offset Provider. The Willowvale Offset Property includes several Lot on Plans described as Lot 214 on CA 311183, Lot 42 on CA 31692, Lot 140 on CA 31918, Lot 213 on CA 31970, Lot 97 on RP 215969, Lot 2 on RP 223480 and Lot 2 on SP 269793). The proposed offset area for this impact site will combine with these surrounding approved and commenced offsets in the Little Kipper Creek Offset Property to consolidate a larger conservation outcome.

The impact area includes a total of 19.1 hectares (ha) which is all considered a Matter of National Environmental Significance (MNES) as it provides critical habitat for the Koala as defined under the EPBC Act. The OMP includes the dedication and rehabilitation of a total of 100.8 ha of land. The offset area as proposed will acquit the required impacts and provide additional benefit for the species. Details of the offset area are provided in **Section 4**. This OMP was prepared to support the EPBC 2021/9070 Preliminary Documentation for the proposed impacts on the impact site.



1.2. Purpose of the Management Plan

The purpose of this OMP is to provide the objectives of the plan, key commitments including milestones and measurables (performance targets) and completion criteria to compensate for significant residual impacts on Koala and Grey-headed Flying-fox. The plan must include (but is not limited to):

- i. the ecological outcomes of the offset area (including baseline survey results);
- ii. management measures proposed to achieve the ecological outcomes;
- iii. for each management action and monitoring outcome, detail how and when performance will be quantified, measured and monitored; and
- iv. detail contingency measures to be implemented if some or all of the specified are not achieved.

1.3. Report Structure

This OMP contains the following sections:

- Section 2: Roles and Responsibilities
- Section 3: Overview of Impact area
- Section 4: Overview of Offset Area
- Section 5: Offset Area Suitability
- Section 6: Baseline Surveys
- Section 7: Environmental Outcomes
- Section 8: Monitoring and Reporting Schedule
- Section 9: Management Framework
- Section 10: Adaptive Management
- Section 11: References
- Section 12: Appendices
 - Appendix A – Impact area – MHQA raw data
 - Appendix B – Offset area – Koala MHQA baseline scoring
 - Appendix C – Offset Area – raw weed mapping and MHQA transect data
 - Appendix D – Offset area – baseline raw SAT data
 - Appendix E – Offset Assessment Guide Calculator Results and Uplift Tables
 - Appendix F – Risk Assessment



2. Roles and Responsibilities

Excluding the regulatory role completed by the Commonwealth Government for the assessment and approval of the offset and the Queensland Government for registering and declaring the Voluntary Declaration and permanent securing mechanism the following people and entities retain key responsibilities for the implementation of this OMP.

A list of key contacts for the project is contained in **Table 1**.

Table 1: Key personnel

Role	Nominated Person	Company / Entity	Contact details
Proponent/Approval Holder	Dan Flanagan	Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust	Daniel@goldfieldsgroup.com.au
Offset Provider	Rob Martyn	Upscale Capital Pty Ltd ATF Koala Farmland Fund 2	rob.martyn@koalafarmlandfund.com.au
Administering Authority	N/A	DCCEEW Compliance Monitoring Branch	EPBCMonitoring@dcceew.gov.au
Suitably qualified person/contractor	Appointed as required by either the proponent or the Offset Provider	Appointed as required by either the proponent or the Offset Provider	Appointed as required by either the proponent or the Offset Provider



3. Overview of Impact Area

3.1. Project and Site

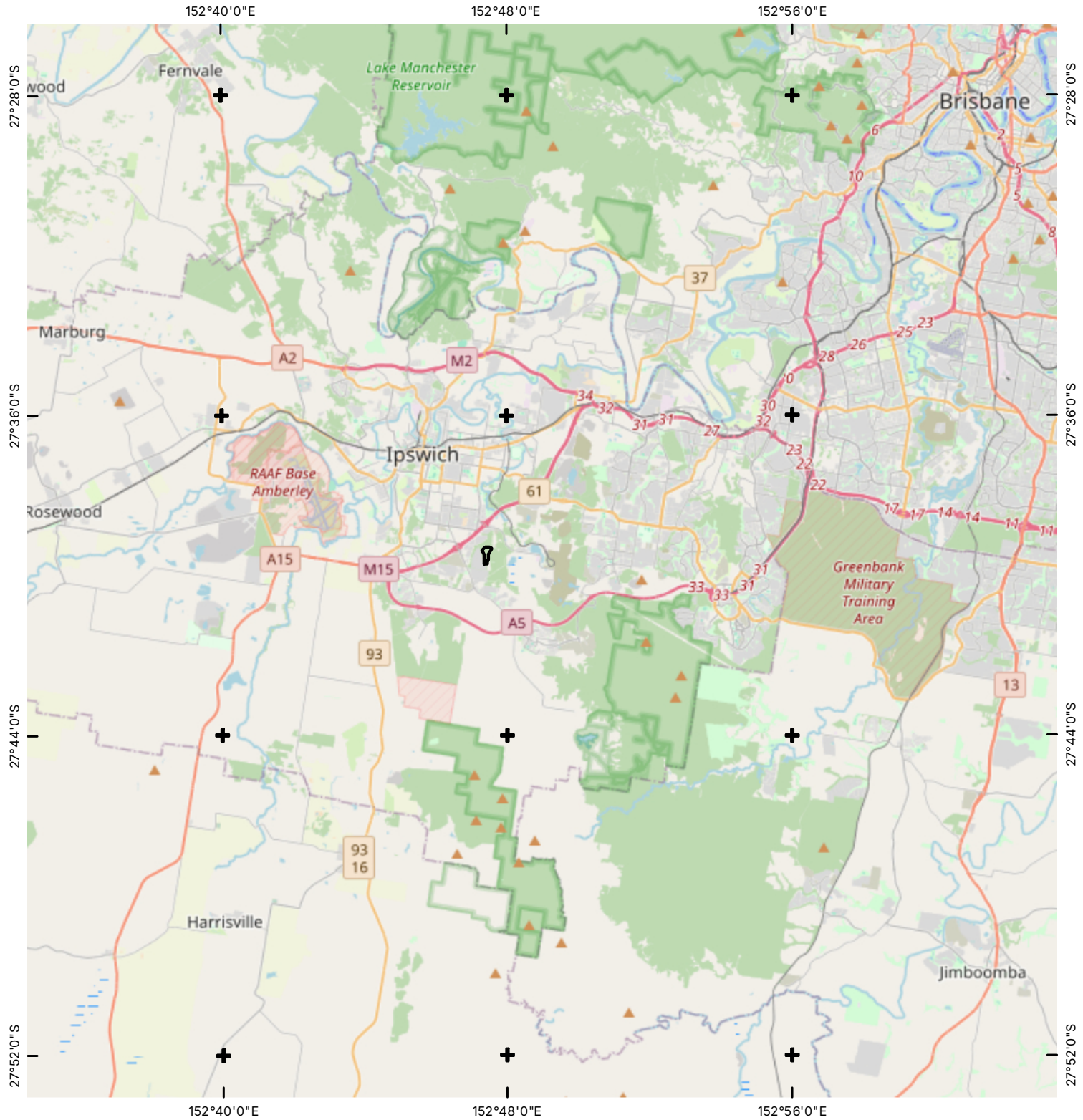
The project located at Fischer Road, Ripley, Queensland, 4306 (described as part of Lot 901 on SP 335423) is located approximately 5.6 kilometres (km) south-east of Ipswich. The impact site is currently vegetated, and exists as vacant land within a matrix of residential development projects, large lot residential properties and major roads (refer **Figure 1** and **Figure 2**). The impact site is located within an area zoned as 'Urban Living' within the Ripley Valley Priority Development Area (RVPDA).

Of the 19.1 ha of total impact area, the entirety is to be cleared to deliver the educational facilities proposed. The project will include a total of 19.1 ha of impact to MNES, specifically Koala and Grey-headed Flying-fox habitat. **Table 2** provides details on the impact area.

Table 2: Details of impact area

Address	Fischer Road, Ripley, Queensland, 4306 Part of Lot 901 on SP 335423
Impact area	19.1 ha
MNES impact area	19.1 ha (refer Plan 1)





LEGEND

 Impact Site [19.1 ha]

FIGURE 1

IMPACT SITE CONTEXT

PROJECT
RIPLEY ROAD, RIPLEY
COORDINATE SYSTEM
GDA 2020 MGA Z56
SCALE (A4)
1:250,000

0 2 4 6 8 10 km



CLIENT

JOLIFIELDS DEVELOPMENT PTY
LTD & THE TRUSTEE FOR
MOREHAMPTON CAPITAL &
TRUSTEE FOR THE GOLDFIELDS
QLD TRUST

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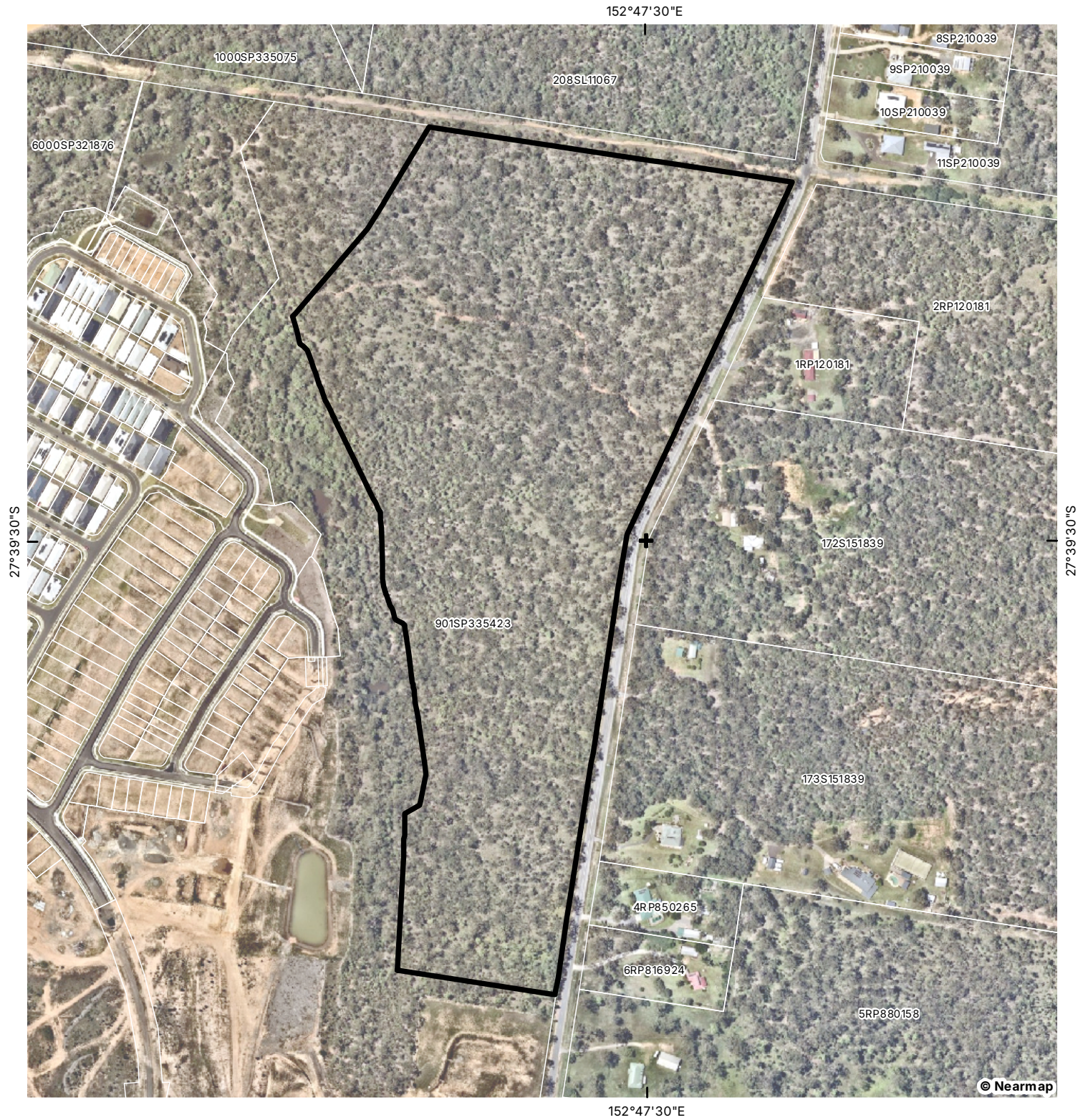
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FILE REFERENCE

10835 E Figure 1 Imp Site Context A

DATE 24/11/2025



LEGEND

- Qld DCDB
- Impact Site [19.1 ha]

FIGURE 2

IMPACT SITE AERIAL

PROJECT
RIPLEY ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:5,000

0 50 100 150 m



CLIENT

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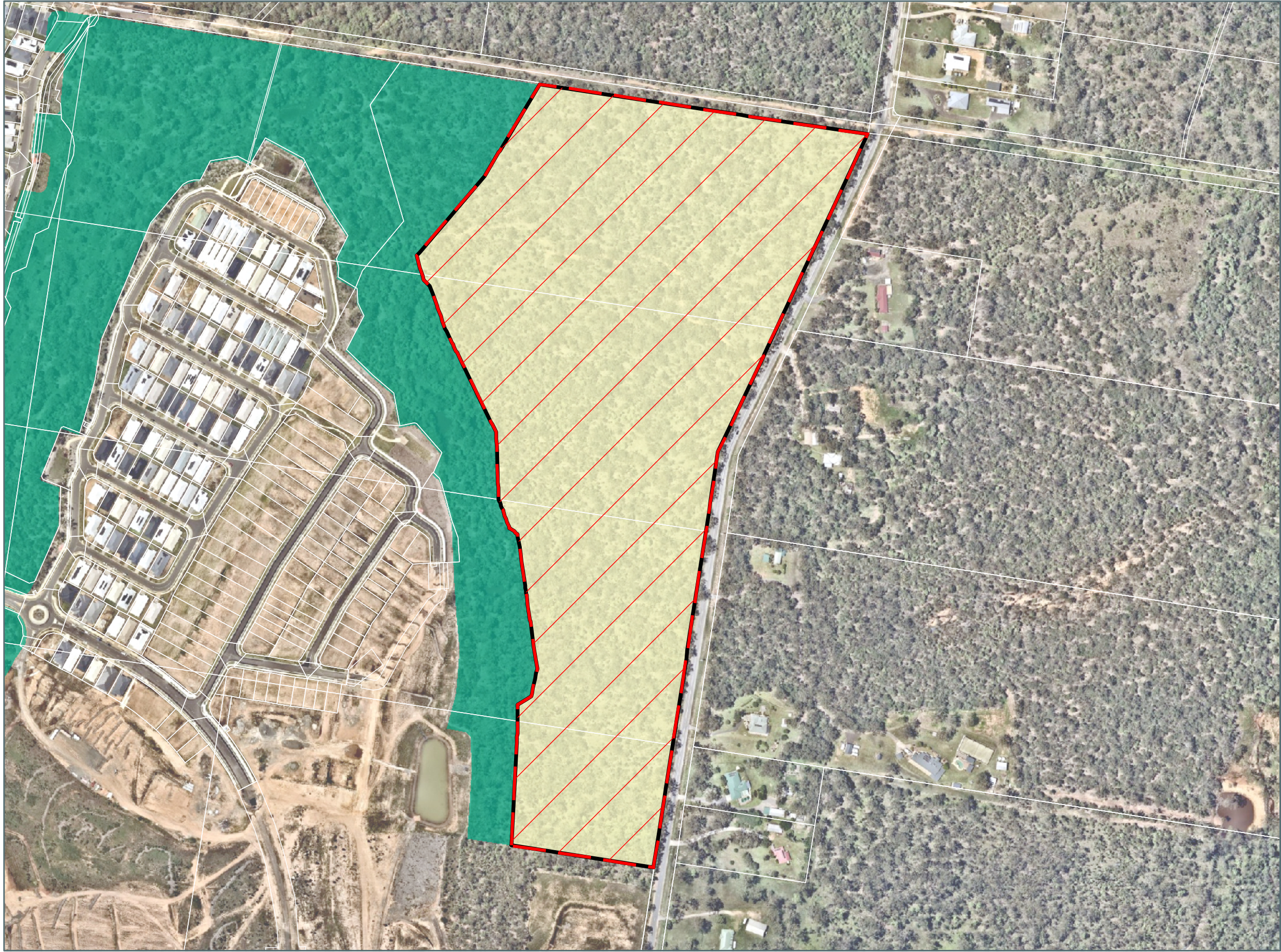
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FILE REFERENCE

10835 E Figure 2 Imp Site Aerial A

DATE 25/11/2025

01. IMPACT SITE DEVELOPMENT FOOTPRINT AND MNES HABITAT



Notes:
The information on this plan is not suitable for any purpose other than the expressed use of the Client. Property dimensions, areas, numbers of lots and contours and other physical features may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of Saunders Havill. Unless a development approval states otherwise, this is not an approved plan.
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LEGEND

Qld DCDB

Impact site [19.1 ha]

MNES Habitat (Koala and Grey-headed Flying-fox) impacted [19.1 ha]

PDA Zoning

Community Use (Education Zone)

Linear Open Space and Ecological Corridor Zone



3.2. Summary of Matters Requiring Offset

The OMP proposes land-based offsets for the following MNES species that will be subject to significant residual impacts as a result of the Project:

- Koala: Loss of 19.1 ha of habitat critical to the survival of the Koala,
- Grey-headed Flying-fox: Loss of 19.1 ha of potential foraging habitat.

Habitat for MNES proposed to be impacted for the project is summarised below.

3.2.1 Vegetation communities impacted

The impact site has been subject to extensive field surveys which involved ground-truthing mapped Regional Ecosystems (RE) under Queensland's *Vegetation Management Act 1999* (VMA). The impact site is entirely mapped as Category B (remnant) vegetation under the VMA. Remnant vegetation present within the impact consists largely of Least Concern Regional Ecosystem (RE) 12.9-10.2 with two (2) small polygons of Of Concern composite RE12.9-10.2/12.9-10.7/12.9-10.16 (refer **Table 3** for RE descriptions). The site has been subject to a Property Map of Assessable Vegetation (PMAV) assessment which involved further ground-truthing of mapped regional ecosystems. The PMAV was certified by the Department of Natural resources, Mines and Energy (DNRME) (PMAV 2005/101543). The PMAV field surveys identified the site being mapped entirely as Category B (remnant) vegetation encompassing the 19.1 ha of the impact site.

The habitat quality and quantum of the 19.1 ha impact area was assessed through field surveys. Vegetation within the impact area was observed via field surveys to largely represent values mapped via the Queensland *Vegetation Management Act 1999* (VMA) mapping. While the impact site is mapped as containing several Regional Ecosystems, field surveys determined vegetation across the site is dominated by species consistent with RE12.9-10.2.

Table 3: Mapped regional ecosystem present within MNES impact site.

Pre-clear RE	VMA status	Description
12.9-10.2	Least Concern	<i>Corymbia citriodora</i> subsp. <i>variegata</i> open forest or woodland usually with <i>Eucalyptus crebra</i> . Other species such as <i>Eucalyptus tereticornis</i> , <i>E. moluccana</i> , <i>E. acmenoides</i> and <i>E. siderophloia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments.
12.9-10.7	Of Concern	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora leiocarpa</i> , <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments.
12.9-10.16	Of Concern	Microphyll to notophyll vine forest +/- <i>Araucaria cunninghamii</i> . Characteristic species include <i>Argyrodendron</i> sp. (Kin Kin W.D.Francis AQ81198), <i>Araucaria cunninghamii</i> , <i>Agathis robusta</i> ,



Pre-clear RE	VMA status	Description
		<i>Backhousia myrtifolia</i> , <i>Cupaniopsis parvifolia</i> , <i>Dendrocnide photiniphylla</i> , <i>Rhodosphaera rhodanthema</i> , <i>Flindersia australis</i> , <i>F. xanthoxyla</i> , <i>Drypetes deplanchei</i> , <i>Olea paniculata</i> , <i>Diospyros geminata</i> , <i>Gossia bidwillii</i> , <i>Excoecaria dallachyana</i> and <i>Vitex lignum-vitae</i> . <i>Archontophoenix cunninghamiana</i> often present in gully floors. Occurs on Cainozoic and Mesozoic sediments.

3.3. Habitat Quality Scoring Methods and Results

3.3.1 Koala – Modified Habitat Quality Assessment (MHQA)

Guidance published by the DCCEEW on valuing habitat quality for a threatened species or ecological community listed under the EPBC Act states it is important that the assessment is not simply a scoring of vegetation 'pristineness'. Rather, there are three components that contribute to the calculation of habitat quality:

- Site condition: This is the condition of a site in relation to the ecological requirements of a threatened species or ecological community.
- Site context: This is the relative importance of a site in terms of its position in the landscape, taking into account the connectivity needs of a threatened species or ecological community.
- Species stocking rate: This is the usage and/or density of a species at a particular site.

To quantify the extent and quality of Koala habitat, the impact and offset sites are assessed using a modified version of the Queensland State Government's 'Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy' Version 1.2 April 2017. The Guide utilises a number of attributes and assessment methods from the BioCondition Assessment Manual v2.2 (Eyre et al 2015). These attributes are also utilised for this Koala Modified Habitat Quality Assessment method (Koala MHQA) with some variations of methods to focus on features known to be prioritised by Koalas, such as the availability of foraging and shelter trees. All adjustments from the published guidelines have been developed in consultation with DCCEEW.

The primary components of BioCondition Assessment (and therefore the Koala MHQA) include:

- Identifying and delineating Assessment Units for the site.
- Utilising a suite of vegetation condition, landscape value and fauna usage attributes that act as indicators of habitat value for the Koala.
- Assessing the indicators against benchmarks for each of these attributes.
- Using the assessment to provide a 'condition' score for Koala habitat.

The following sections detail the methods utilised to delineate assessment units and assess site condition, site context and species stocking rate under the Koala MHQA. Justification is also provided for condition attributes and score weightings.



This Koala MHQA must be applied to both the impact and offset sites including demonstrating future uplift of habitat values at the offset site with predicted changes in condition scores resulting from proposed management measures.

Delineating Assessment Units

Assessment Units (AUs) are used to determine where and how many transects are needed to adequately assess the condition of the habitat site. The BioCondition Assessment Manual provides guidance for delineating AUs as follows:

- They should be relatively homogenous defined by a unique RE and broad condition state (i.e. 'remnant' versus 'regrowth' versus 'non remnant').
- Non-remnant vegetation can be further delineated into separate assessment units if required (i.e. 'young woody regrowth' and 'non-remnant vegetation'). This delineation can be obtained by using the woody cover mapping of SLATS and the pre-clearing RE mapping.
- They do not need to be continuous tracts, and can occupy two or more discrete areas, but should be larger than 1 ha in area.

While RE and SLATS mapping provide useful tools for identifying vegetation communities, AUs for Koalas should be based on habitat suitability for the species and not vegetation health or structural diversity.

Koala AUs will initially be identified using a combination of RE and SLATS mapping as well as contemporary (<12 months old where possible) and historical aerial imagery. The mapping tools will provide a basis for delineation of the AUs with aerial imagery used to 'sanity check' vegetation extents and ages.

Koala AUs are likely to align with RE mapping however will be defined based on potential habitat value for Koalas:

- **Mature Habitat (remnant)** – Vegetation community dominated by koala food trees (Eucalypt, *Corymbia* and *Angophora* species) and a defined understorey left relatively intact for at least 20 years aside from minor disturbance such as selective cattle grazing and edge effects. Patches must be a minimum of 1 ha.
- **Foraging Habitat (Regrowth)** – Vegetation containing koala food trees present for at least 10 years. Understorey vegetation may be disturbed from activities such as intense grazing or land management. Less disturbed areas may contain a high level of emergent koala food trees. Patches must be a minimum of 1 ha.
- **Dispersal Habitat (Non-remnant)** – Highly disturbed or cleared areas (e.g. cattle grazing paddocks) which may contain scattered trees or small clumps of trees. Understorey and ground cover vegetation is often dominated by pasture grass (native or exotic) and weeds but can also include native regrowth.



Koala AUs may comprise of several distinct vegetation communities (REs) as long as the characteristics are those of mature, foraging or dispersal habitat. Different communities will be assessed against the relevant condition benchmarks for that RE (refer to section 1.2.3).

Koala AUs will be confirmed by ground truthing dominant species and vegetation extents prior to completing habitat assessment transects. Ground truthing will be carried out in two steps:

- Confirmation of AU vegetation communities: mapped vegetation communities, including Preclear REs for dispersal habitat, will be confirmed using a mix of observation points and Quaternary floristic surveys collected and recorded in accordance with Neldner et. al. (2023). If the mapping is incorrect the relevant RE will be assigned.
- Confirmation of AU extents: GPS handheld units will be used to compare mapped RE and SLATS polygons to on ground vegetation extent. Where extents do not align field ecologists will walk the edge of the AU while the GPS tracklog is engaged and the patch extent will be rectified using Geospatial tools such as ArcGIS.

At offset sites, AUs will generally align with Offset Management Units (OMUs) as management measures are likely to be the same for habitat types.

Planning and Implementing Transects

Number and Location of Transects

The BioCondition assessment manual suggests two to five transects per AU with AUs < 60 ha to aim for at least two transects and AUs > 500 ha to aim for five transects. The Guide to determining habitat assessment quality Version 1.2 is more prescriptive and provides suggested number of transects based on the size of the AU. These are:

- 0 to 50 ha - at least two transects
- 50 to 100 ha - three transects
- 100 to 500 ha - four transects
- 500 to 1,000 ha - five transects
- 1,000+ ha - six transects

The number of MHQA transects completed in an AU should comply with the number outlined in the Guide unless justification is provided for a reduced number of transects. For example, less transects may be valid in small (<10 ha) homogenous AUs (the same RE type and similar condition).

Transects will be carried out in locations that are representative of the AU being assessed. Where possible they will also be located at least 50 m from any major disturbance, such as a road or a dam, and at least 1 km apart to ensure independence of the data.

Transect Layout



MHQA transects constitute a 100 m x 50 m (0.5 ha) area, within which 13 site-based attributes are measured including plant species richness by lifeform (trees, shrubs, grasses and forbs). This correlates to the habitat and BioCondition reference site assessment process used to identify condition benchmarks for attributes.

The transect is marked out by laying out a 100 m centreline that follows the contour (i.e. along a slope rather than down a slope) with markers placed at 25 m intervals along the transect and 25 m either side to assist with calculation of attributes. A summary of the assessment process taken directly from the BioCondition assessment manual is provided below along with a schematic diagram (Insert 1):

1. 100 x 50 m area: assessed for number of large trees, recruitment of canopy species, tree canopy height and native tree species richness. In long, linear assessment units (e.g. riparian areas), it may be necessary to adjust the configuration of the 100 x 50 m plot area so that these attributes are adequately sampled. In these cases, it is recommended that the plot area remains the same, if possible e.g. extend the length of the plot to 200 m, but reduce the width of the plot to 25 m.
2. 100 m transect: assessment of tree canopy cover and native shrub canopy cover.
3. 50 x 10 m sub-plot, centred from the 25 m point to the 75 m point along the centre transect, and encompassing 5 m either side of the transect: assessed for non-native plant cover and native plant species richness of shrubs, grass and non-grass species.
4. 50 x 20 m sub-plot, centred from the 25 m point to the 75 m point along the transect, and encompassing 10 m either side of the transect: assessed for coarse woody debris.
5. Five 1 x 1 m quadrats, starting at the 35 m point and located on alternate sides of the centreline, 10 m apart along the 100 m transect: assessed for native grass cover and organic litter (an average value is derived over the five quadrats).

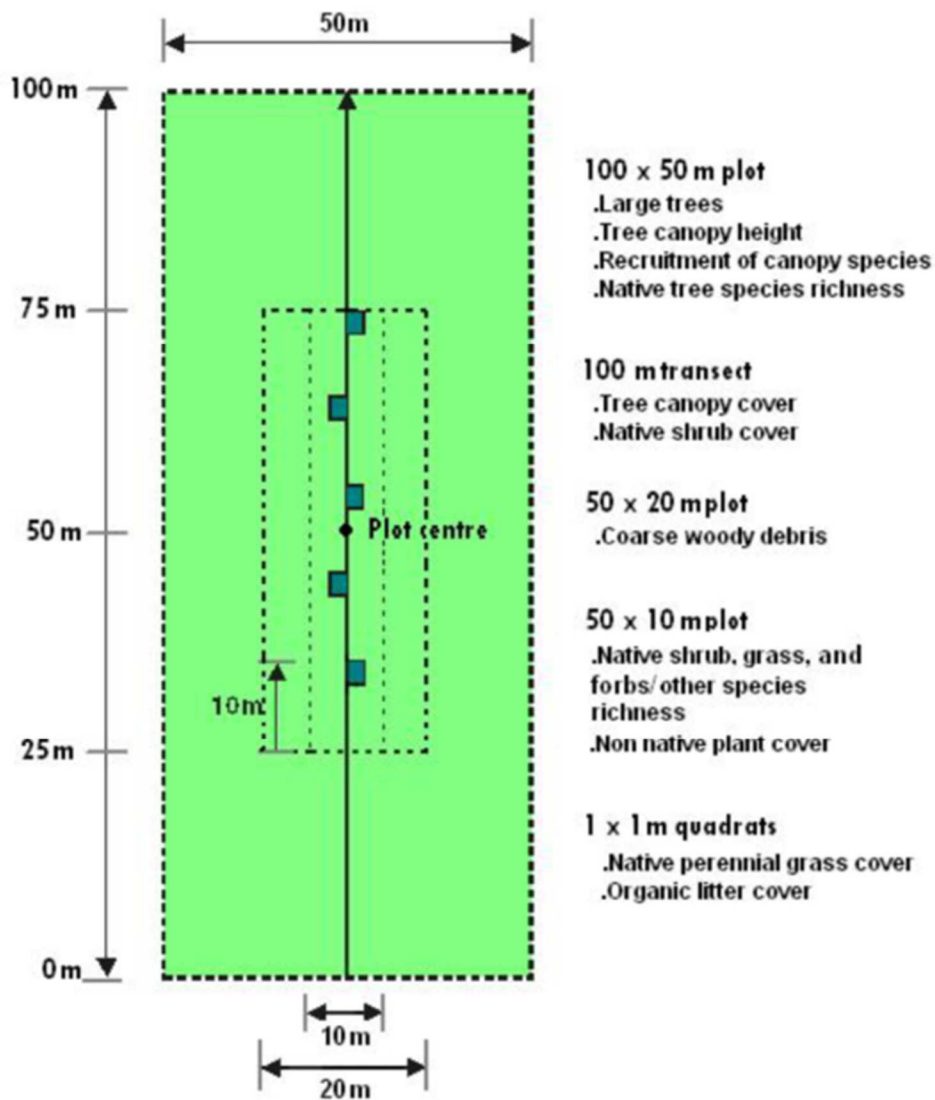
Photos must be taken of each quadrat as well as the four compass directions (approximately) from the centre point of the transect.

A detailed breakdown of how data for each attribute is to be collected is located in Section 5 of the BioCondition assessment manual as depicted in **Insert 1**.

Condition Benchmarks

Condition benchmarks are quantitative values derived by the Queensland Herbarium from example sites of in good condition to be used as a reference value for comparison purposes. They are specific to each RE and have been assessed for each attribute in the BioCondition assessment manual. Benchmarks used in the MHQA must be taken from the Regional Ecosystem Technical Descriptions (Ryan 2012) and the BioCondition Benchmarks spreadsheet published by the Queensland Herbarium. Where necessary additional technical information should be sourced directly from the Herbarium.





Insert 1: BioCondition Transect Layout (Taken from the BioCondition assessment manual)

Habitat Assessment Component Weighting

The EPBC Act Offset Assessment Guide (OAG) requires habitat scores to be input as a whole number out of 10 to quantify impacts and assess existing and future offset site value. To achieve this, weightings have been provided to the three components that contribute to the calculation of habitat quality:

- Site condition and context will each be given a weighted score of 3/10.
- Species stocking rate will be given a weighted score of 4/10.

The weighting of site condition and context is justified by several studies (McAlpine et al. 2006; Harwood et al. 2025) that have found that preferred Koala food tree and landscape level tree cover are key factors driving koala habitat use and distribution. The study by Harwood et. al. (2025) found no difference in Koala



preference between mature habitat and previously disturbed rehabilitated habitat with healthy breeding populations observed in the rehabilitation areas. Whisson et al. (2023) confirmed the overarching importance of landscape-scale factors in determining koala site occupancy and distribution in modified landscapes. The study found that the probability of Koala presence was positively influenced by landscape scale tree cover and negatively influenced by road density.

The weighting of stocking rate is justified as it is the representation of the matter being significantly impacted. The matter being impacted and offset is the Koala, therefore, it is imperative that impact and offset sites can contain Koala populations now or in the future.

Site Condition Scoring (3/10)

Assessing site condition is an integral step in determining the quantification of impacts, while also identifying whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset. Site condition is assessed for each Koala AU using a suite of attributes to describe the structure and function of the vegetation community and is benchmarked against the expected range for a relatively undisturbed community.

The Koala MHQA uses 15 attributes to assess site condition. Of the 15 attributes 13 are taken directly from the BioCondition assessment manual and scored against the relevant RE benchmark. The remaining attributes, quality and availability of foraging habitat and quality of shelter habitat, have been developed specifically for the Koala MHQA.

Site condition is assigned a total out of 160 that is then scaled to a score out of three for use in the overall habitat score.

Biocondition Attributes

Each condition attribute and the associated score when assessed against the relevant RE benchmark is provided in **Table 4**. Attribute scores are calculated at the AU level by using the average benchmark percentage across all transects in that AU. The total possible score for the 13 BioCondition attributes is 80 which accounts for 50% of the overall site condition score.

Table 4: Koala site condition scoring attributes (BioCondition Manual)

Site condition attribute	Scoring and benchmark percentage			
(1) Recruitment of woody perennial species in ecologically dominant layer	Score	0	3	5
	Benchmark	<20%	≥20-75%	≥75%
(2) Native plant species richness – trees	Score	0	2.5	5
	Benchmark	<25%	≥25-90%	≥90%
	Score	0	2.5	5



Site condition attribute		Scoring and benchmark percentage			
(3) <i>Native plant species richness – shrubs</i>	Benchmark	<25%	≥25-90%	≥90%	
	Score	0	2.5	5	
(4) <i>Native plant species richness – grasses</i>	Benchmark	<25%	≥25-90%	≥90%	
	Score	0	2.5	5	
(5) <i>Native plant species richness – forbs</i>	Benchmark	<25%	≥25-90%	≥90%	
	Score	0	3	5	
(6) <i>Tree canopy height</i>	Benchmark	<25%	≥25-70%	≥70%	
	Score	0	2	3	5
(7) <i>Tree canopy cover</i>	Benchmark	<10%	≥10% - <50%	≥200%	≥50-200%
	Score	0	3	5	
(8) <i>Shrub canopy cover</i>	Benchmark	<10%	≥10% - <50% or ≥200%	≥50- <200%	
	Score	0	1	3	5
(9) <i>Native perennial grass cover</i>	Benchmark	<10%	≥10-50%	≥50-90%	≥90%
	Score	0	3	5	
(10) <i>Organic litter</i>	Benchmark	<10%	≥10%-50% or ≥200%	≥50- <200%	
	Score	0	5	10	15
(11) <i>Large trees</i>	Benchmark	0%	0-50%	≥50-100%	≥100%
	Score	0	2	5	
(12) <i>Coarse woody debris</i>	Benchmark	<10%	<50% or ≥200%	≥50% or <200%	
	Score	0	3	5	10
(13) <i>Non-native plant cover</i>	Benchmark	>50%	≥25-50%	≥5-25%	<5%
	Score	0	3	5	10

Quality and Availability of Food and Foraging Habitat

Food-tree availability is consistently identified as one of the most important determinants of Koala population dynamics, owing to their highly specialised folivorous diet and dependence on a narrow subset of *Eucalyptus* species (Kavanagh et al. 2007). Given the importance of foraging resources to Koala habitat usage this attribute is assigned a score out of 40 which accounts for 25% of the overall site condition score.

To reflect the importance of food trees to Koala habitat, the quality and availability of foraging habitat is assessed using two parameters, abundance of Koala food trees and tree canopy cover.

These two parameters provide an indication of the number of trees available for Koalas to forage in and the amount of resource available from those trees. Weighting of the parameters in the assessment is 80% for food tree abundance and 20% for canopy cover as Koalas are known to graze on trees of any size and established smaller trees will grow to provide a larger canopy area over time.

Koala food trees abundance is calculated at each transect by counting all Koala food trees (*Eucalypt*, *Corymbia* and *Angophora* species) with a DBH >100 mm within a 100 m x 20 m plot running 10 m either side of the centre line of the transect. The count is multiplied by 5 to produce a stem density per hectare, which is averaged across the assessment unit. The count is then compared to the average stem density



per hectare identified in the regional ecosystem technical descriptions (Ryan 2019 - additional description for RE 12.9-10.2 provided by the Queensland Herbarium). Where the technical description provides stem densities for multiple tree strata, only the T1 and T2 strata are to be utilised as they will form the canopy and primary food source for koala. A score out of 8 is calculated as follows:

- <1% – 0/8
- 1%-24.99% of benchmark – 2/8
- 25% - 49.99% of benchmark – 4/8
- 50% - 74.99% of benchmark – 6/8
- 75% - 100%+ of benchmark – 8/8

Canopy in Southeast Queensland Eucalypt woodland is dominated by Koala food tree species, therefore, the tree canopy cover collected a part of the biocondition assessment provides an accurate estimate of food source availability, and if anything, provides an overestimate of food availability giving a conservative baseline score. Average canopy cover from the biocondition parameters is utilised to calculate a score out of 2 as follows:

- <1% – 0/2
- 1%-24.99% of benchmark – 0.5/2
- 25% - 49.99% of benchmark – 1/2
- 50% - 74.99% of benchmark – 1.5/2
- 75% - 100%+ of benchmark – 2/2

The scores for food tree abundance and canopy cover are then added together to provide an overall score out of 40 for quality and availability of food sources. For the purposes of the MHQA condition assessment, scores are categorised as follows:

- 0-2.99/40 will be given a 4 in the MHQA
- 3-6.99/40 will be given a 20 in the MHQA
- 7-10/40 will be given a 40 in the MHQA

Quality and Availability of Shelter Habitat

Koalas choose shelter in trees that provide thermal protection, safety from predators, and access to preferred food trees (Briscoe et al 2014; Ellis et al 2012; Law et al 2022). Studies have found shelter trees are not necessarily food species such as eucalypts but include a range of ancillary species as long as they are near a food source. Trees selected are often larger with a DBH of 300 mm – 600 mm. Given the importance of shelter habitat to koala habitat usage this attribute is assigned a score out of 40 which accounts for 25% of the overall site condition score.



Two parameters have been used to assess shelter habitat values at the impact and offset sites:

- Abundance of koala food trees and ancillary trees (referred to as shelter trees)
- Abundance of large trees

These two parameters provide an indication of the number of koala shelter trees available on the impact and offset sites as well as existing larger trees that can be preferred while resting through the day. Weighting of the parameters is 60% for shelter tree abundance and 40% for large trees.

Koala food trees abundance is calculated at each transect by counting all Koala food trees (*Eucalypt*, *Corymbia* and *Angophora* species) with a DBH >100 mm within a 100 m x 20 m plot running 10 m either side of the centre line of the transect. The count is multiplied by 5 to produce a stem density per hectare, which is averaged across the assessment unit. The count is then compared to the average stem density per hectare identified in the regional ecosystem technical descriptions (Ryan 2019 - additional description for RE 12.9-10.2 provided by the Queensland Herbarium). Where the technical description provides stem densities for multiple tree strata, only the T1 and T2 strata are utilised as they will form the canopy and primary food source for koala. A score out of 6 is calculated as follows:

- <1% of benchmark – 0/6
- 1%-24.99% of benchmark – 1.5/6
- 25% - 49.99% of benchmark – 3/6
- 50% - 74.99% of benchmark – 4.5/6
- 75% - 100%+ of benchmark – 6/6

Large trees are also counted within the 100m x 20 m plot at each MHQA transect and compared to the benchmark for the Regional Ecosystem. A score out of 4 is calculated as follows:

- <1% – of benchmark 0/4
- 1%-24.99% of benchmark – 1/4
- 25% - 49.99% of benchmark – 2/4
- 50% - 74.99% of benchmark – 3/4
- 75% - 100%+ of benchmark – 4/4

The scores for shelter tree abundance and large trees are then added together to provide an overall score out of 10 for quality and availability of shelter. For the purposes of the MHQA condition assessment, scores are categorised as follows:

- 0-2.99/10 will be given a 4 in the MHQA
- 3-6.99/10 will be given a 20 in the MHQA
- 7-10/10 will be given a 40 in the MHQA



Site Context (3/10)

Site context considers the landscape characteristics adjoining the site. In the Koala MHQA site context is measured using seven attributes adapted from the Guide to determining terrestrial habitat quality version 1.2. The attributes include size of the patch, connectedness, context, ecological corridors, role of site to species, threats to species and species mobility.

Site condition is assigned a total out of 56 which is then scaled to a score out of three for use in the overall habitat score.

Identifying Koala Habitat for Site Context

Unlike the Guide to determining terrestrial habitat quality version 1.2 where some landscape characteristics are assessed using the surrounding mapped remnant vegetation only, the MHQA is assessed using surrounding Koala habitat. While remnant eucalypt forest vegetation is critical habitat for Koala, they can utilise areas of non-remnant vegetation or high value regrowth vegetation that does not yet achieve remnant status. Therefore, site context under the MHQA accounts for surrounding Koala habitat rather than remnant vegetation.

Habitat critical to the survival of the Koala is determined rough GIS tools using the combination of the Unsupervised Classification tool within ESRI's ArcGIS software and the most recently available aerial photograph from Nearmap.com. The Unsupervised Classification tool is able to determine vegetation areas through the near infrared (NIR) composite band of the Landsat 8 imagery available online. The tool is able to create a dataset of vegetation areas without the analyst's intervention providing a rapid method for mapping habitat critical to the survival of the Koala over large regions such as South East Queensland. Nearmap.com aerial image is used for calibration purposes, particularly when dealing with smaller scale assessment areas. The dataset created by the Unsupervised Classification tool is revised using the latest aerial imagery available from Nearmap.com at scale of 1:40,000 and provides a more accurate depiction of habitat critical to the survival of the Koala at the landscape scale.

Size of Patch

Patch size is measured using a GIS tool and is the size of the patch being assessed and any directly connecting koala habitat. The calculation of the area of the patch size uses the method outlined in the BioCondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site.

Patch size is measured at the koala AU level with dispersal habitat not considered to be part of a patch, however it can provide connectivity between other areas of a patch. Size of patch is scored out of 10 as follows:

- <5 ha – 0/10
- 5–25 ha – 2/10
- 26–100 ha – 5/10
- 101–200 ha – 7/10



- >200 ha – 10/10

Connectedness

Connectedness relates to the capacity that the species have to disperse through the landscape. This attribute is calculated using GIS by measuring the length of koala habitat along the boundary of the site, calculated as a percentage. Connectedness is scored out of five as follows:

- <10% of the boundary - 0/5
- >10-50% of the boundary - 2/5
- >50-75% of the boundary - 4/5
- >75% of the boundary - 5/5

Context

The context score is calculated using GIS to quantify the amount of vegetation immediately surrounding the assessment site. It is measured as the percentage of koala habitat within a 1 km radius of the site. Context is scored out of five as follows:

- <10% Koala habitat - 0/5
- >10-30% Koala habitat - 2/5
- >30-75% Koala habitat - 4/5
- >75% Koala habitat - 5/5

Ecological Corridors

This attribute is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. An ecological corridor for assessing this attribute is defined as an area mapped as either a state, bioregional, regional or sub-regional corridor. Ecological corridors are scored out of six as follows:

- Not within a corridor – 0/6
- Sharing a boundary with a corridor – 4/6
- Whole or partly within a corridor – 6/6

Role of Site Location to species Overall Population in the State

This attribute is based on the observed role of the site in relation to the overall population of the species. The scoring table considers the species' use of the site – such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival. Role of site location is scored out of 5 as follows:

- Not likely to be critical for species survival – 1/5



- Likely to be critical for species survival – 4/5
- Known to be critical for species survival – 5/5

Threats to the Species

This attribute identifies the presence and severity of threatening processes observed at or adjacent to the site. Key threats impacting the koala identified in the Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory include:

- Clearing for development;
- Creation of a barrier to movement;
- Introduction or spread of disease or pathogens;
- Risk of high-intensity fires;
- Degradation of habitat from hydrological change; and
- Introducing or increasing mortality attributed to vehicle strike or dog attacks.

The highest threat level is given to a site if it is isolated from other Koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1,500 m of the site boundary. A risk matrix relative to the conservation advice for the Koala is applied to determine threats to species. The matrix is provided as **Table 5** and described below:

- Habitat loss is considered 'Very High Risk' under the Koala conservation advice. Clearing and degradation of habitat is scored Low, Moderate and High and weighted according to risk factor relative to the expected threat score for each (summed vertically as 15 for Low, 7 for Moderate or 1 for High).
- High intensity bushfire is considered 'Very High Risk' under the Koala conservation advice. Inappropriate fire regimes is scored Low, Moderate and High relative to the implementation of an endorsed bushfire management plan and fuel load weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
- Vehicle strike is considered 'Moderate Risk' under the Koala conservation advice. Vehicle strike is scored Low, Moderate and High relative to the presence and status of nearby roads (major road = highway or connector, minor road = local or private) and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
- Dog attack is considered 'Moderate Risk' under the Koala conservation advice. Dog attack is scored Low, Moderate and High relative to the presence of dogs and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).

Overall threats are scored either a one, seven or 15 for high, moderate and low.



Table 5: Koala Threat Scoring Matrix

Metric	Low	Moderate	High
Threat Thresholds			
Clearing and Degradation of Habitat High Risk	One of the following applies to the site: 1. A legally binding protective mechanism. 2. Conservation zoning where clearing is not permitted. 3. If $\leq 30\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: $>30\%$ and $<70\%$ of the area within a 5km buffer of the site is cleared or disturbed land.	One of the following applies to the site: 1. The site is zoned for development. 2. If $\geq 70\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.
Score Weighting	6	2.8	0.4
Inappropriate Fire Regimes High Risk	A government endorsed Bushfire Management Plan (BMP) including specific measures for protecting koala habitat is in effect.	Moderate potential bushfire risk identified by State or Local government within or adjacent ($<100\text{m}$) the site. OR A site-specific BMP is in effect.	High or very high bushfire risk identified by State or Local government within or adjacent ($<100\text{m}$) the site.
Score Weighting	6	2.8	0.4
Vehicle Strike Moderate Risk	Located more than 1km from a major road AND Fauna safe design features in place between the site and any minor roads within 500m	Located $<500\text{m}$ from a major road with fauna safe design features) OR Located $<1\text{km}$ from a major road accessible for koalas (no fauna safe design) OR Minor roads servicing residential or industrial areas are located within 500m	Located $<500\text{m}$ from a major road accessible for Koala (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m
Score Weighting	1.5	0.7	0.1
Dog Attack Moderate Risk	No dogs recorded on or adjacent to the site OR A government endorsed pest management plan is in place with completion criteria targeting no dog recordings.	Dogs recorded on site but adequate refuge for Koalas ($>70\%$ canopy cover).	Dogs recorded on site and limited refuge for Koalas ($<70\%$ canopy cover)
Score Weighting	1.5	0.7	0.1
Threshold Analysis	≥ 10	>4 and ≤ 10	≤ 4
MHQA Score	15	7	1



Species Mobility Capacity

Species mobility is scored based on the presence and severity of factors that may contribute to a reduction in the mobility of the species. This can include a barrier that would result in a long-term reduction in genetic fitness or access to important resources.

The Guide to Determining Terrestrial Habitat Quality version 1.2 scores this attribute based on the presence and severity of factors that would contribute to a reduction in the mobility of the species. The scoring is based on a percentage reduction of mobility ranging from minor restriction (0-25% reduction) to severely restricted (76-100%). A score of 1, 4, 7 or 10 may be attributed depending on the level of restriction. Score categories are summarised in **Tabel 6**.

Table 6: Species Mobility Scoring Categories

Restriction	Score
Severely restricted (76–100% reduction)	1
Highly restricted (51–75% reduction)	4
Moderately restricted (26–50% reduction)	7
Minor restriction (0–25% reduction)	10

The Guide references the presence of barriers that would result in a long-term reduction in genetic fitness or access to important resources as an example of how mobility can be reduced. However, it is noted that the presence or absence of barriers alone do not exclusively determine the percentage reduction in mobility.

Factors that may limit or impede mobility for the koala used to inform this assessment include:

- The presence of large stretches of cleared land where uses are incompatible with koala movement. This may include intensive agriculture (e.g. cropping) or commercial uses (e.g. hardstand or carparks).
- The presence of thick lantana infestations in woodland or gullies.
- Waterways larger than 40 m wide.
- Roads such as 4-lane arterial roads or smaller connectors that are highly trafficked and safe koala movement features such as underpasses are not present.
- The presence of a non-climbable fences and other small-scale infrastructure.
- The presence of a rail corridor or other linear infrastructure with regular anthropogenic uses.

While the guideline identifies features that restrict mobility, they are not attributed a category of restriction. A literature review has been completed to identify which features would be considered to have the potential to be a severe, high or moderate restrictions to dispersal. The outcomes are summarised in **Table**



7. It is of note that recent studies have found that koalas spend very little time on the ground, yet ground movement is disproportionately risky (vehicle strike/dog attack), reinforcing the importance of impediments that force ground travel such as clearing gaps, major roads and wide waterways (Rus et al. 2021; McAlpine et al. 2006).

Table 7: *Restrictions to Dispersal*

Impediment	Primary Effect on Mobility	References
Habitat Loss & Fragmentation	koalas are strongly affected by habitat loss/fragmentation and reduced functional connectivity, with fragmentation linked to changes in movement and space use, and to reduced occurrence as patch isolation increases.	Rhodes et al. 2006 McAlpine et al. 2006 Youngentob 2021 Rus et al. 2021
Roads & Vehicle Traffic	Roads act as hard physical barriers; vehicle strikes kill dispersing koalas. Roadkill risk occurs across road classes and scales.	Rhodes et al. 2006 Lunney et al. 2002
Fencing & Small-Scale Infrastructure	Fences can prevent koalas from reaching adjacent habitat patches, particularly when too high or lacking climbable surfaces.	NSW Department of Planning and Environment (2022) McAlpine et al. 2006
Human Disturbance	Koalas and other small mammals tend to avoid habitats close to construction sites, recreational areas such as bike paths and parks and other human activities. If major anthropogenic disturbance is located adjacent the site, it is considered a high barrier to dispersal.	McAlpine et al. 2006 Blickley and Patricelli 2010
Dense weed infestation	Weed invasion alters vegetation structure, reduces habitat quality, and can significantly influence how koalas move through the landscape. A dense weed infestation is defined as at least 50% cover.	NSW Department of Planning and Environment (2022)
Waterways	Waterways can impede koala movement primarily by creating physical gaps in canopy connectivity, forcing koalas to travel on the ground where they are more vulnerable to predation and vehicle strikes. Large waterways (>40 m wide) are considered a significant barrier because they isolate habitat patches and reduce safe dispersal routes.	Rhodes et al. 2006 McAlpine et al. 2006

Species mobility capacity is calculated using the following method:

- A 1 km buffer from the site boundary is used as the boundary to describe landscape permeability.
- The site is split into four quadrants (north, east, south and west).



- Each quadrant will be reviewed using a combination of desktop and field assessment to identify if any restriction to mobility.
- For each quadrant, assign a single mobility reduction score using the worst (highest) severity impediment present in that quadrant:
 - No or any minor restriction – 0%
 - Any moderate restriction – 40%
 - Any high restriction – 65%
 - Any severe restriction – 90%

The mobility reduction in each quadrant is assigned using the guidance set out in **Table 6**. Reduction scores must be supported by site specific information including at a minimum:

- Recent aerial imagery and land use mapping such as council planning schemes.
- Review of transport data layers (roads hierarchy) and waterway data layers.
- Field visual validation (photos and field notes) including fence types/continuity, clearing areas and disturbance, weed density, road widths and crossing opportunities, traffic context.

An overall restriction in mobility for the site is calculated using the following equation:

$$\text{Overall mobility reduction (\%)} = (Q_N + Q_E + Q_S + Q_W) / 4$$

A score is then allotted according to the mobility restriction severity scoring from the Guide to Determining Terrestrial Habitat Quality Version 1.2 (**Table 8**).

Table 8: Mobility Reduction Guideline

Impediment	Minor / No Restriction	Moderate Restriction	High Restriction	Severe Restriction
Habitat fragmentation	Continuous or near-continuous canopy linkage across the quadrant; cleared gaps are small and have multiple treed stepping-stones.	Noticeable clearing creates large (>200m) and repeated canopy gaps that potentially force occasional ground travel; movement corridors exist but are constrained.	Extensive clearing or hostile matrix (e.g., intensive/agricultural or hardstand dominance) leaving only narrow/isolated treed lines.	Quadrant is effectively isolated from other habitat patches (large open/hostile matrix) such that safe dispersal routes are minimal; likely forces prolonged ground movement.
Roads & vehicle traffic	Local/low-traffic roads with frequent safe crossing opportunities and good verge tree cover.	Collector roads or moderate traffic where crossings are possible but risky; limited safe crossing structures.	Major arterial roads/high traffic where crossings are infrequent; underpasses/overpasses absent or poorly placed.	Multi-lane/high-traffic barrier road(s) dominating the quadrant such that they function as a hard barrier and/or strongly elevate mortality risk.



Impediment	Minor / No Restriction	Moderate Restriction	High Restriction	Severe Restriction
Fencing & small-scale infrastructure	Wildlife-permeable fencing (e.g., pass-under/over opportunities), discontinuous or low coverage.	Continuous fencing segments but with frequent permeability features (gaps/ramps/trees bridging).	Long continuous non-climbable fencing (e.g., solid barriers) or dense small infrastructure constraining movement pathways.	Near-continuous barrier fencing networks (often urban/residential interface) that effectively block passage between habitat elements.
Human uses / disturbance	Low intensity use; limited disturbance footprint; habitat adjacent remains quiet/low risk.	Regular human activity (tracks, recreation) causing some avoidance; still passable.	High human activity (e.g. construction, industrial edges) creating strong avoidance zones.	Dominant urban/industrial land use adjacent to habitat such that movement is highly constrained and risk elevated.
Dense weed infestations	Sparse weeds; understorey does not block movement lines.	Dense weed patches locally constrain movement lines (operationally, $\geq 50\%$ cover in key strips).	Dense weeds widespread across likely movement corridors, strongly reducing permeability and/or access to trees.	Dense weeds and clearing/other barriers combine to leave few passable routes.
Waterways)	No major waterways, or narrow waterways with frequent canopy linkage/bridging points.	Waterway present but typically crossable at narrower points or with adjacent canopy connections.	>40 m wide waterway present with limited canopy linkage, forcing detours/ground travel.	Multiple >40 m channels or a major river barrier dominating the quadrant; crossings rare and risky.

Species Stocking Rate

The MHQA incorporates species stocking rate as an attribute not addressed under the traditional terrestrial habitat assessment methodology. Species stocking rate is an estimate of the koala carrying capacity of the site at the time of undertaking the survey.

Species stocking rate is assessed at the AU level and is assigned a total out of 70 which is then scaled to a score out of four for use in the overall habitat score.

Given the discreet nature of the koala and limited to no published literature on habitat carrying capacity of the species, the species stocking rate scoring methodology has been derived through the collation of site-specific surveys and surrounding contextual habitat analysis. Species stocking rate is calculated using the following parameters:

- Species presence on or adjacent to the site – Evidence may be direct in the form of observation of Koalas, or indirect via the presence of scats. A range of methods should be employed to confirm



species presence including scat meanders and targeted searches with a high probability of detection; such UAV drone surveys. A combination of methods produces a higher reliability of data when extrapolating koala density.

- Species usage of the site (habitat type and evidenced usage) – Species usage is scored based on the AU site condition score as follows:
 - 0 = not habitat
 - 0 and < 1/3 = low availability of foraging or breeding habitat
 - 1/3 and < 2/3 = moderate availability of foraging or breeding habitat
 - 2/3 = high availability of foraging or breeding habitat

Uplift at offset sites is capped at one level (i.e. dispersal habitat can only uplift to foraging habitat) unless strong evidence is provided for a two-level uplift.

- Approximate density of the species on the site – measured through the use of the SAT method, which is an industry recognised technique for identifying presence/absence of koala and measuring activity. SAT survey results are interpreted using the broad population categories provided in the Australian Koala Foundation Koala activity level classification table to infer an activity level or approximate density. These categories being 'East Coast (low)', 'East Coast (med-high)' and 'Western (med-high)' are shown in Phillips and Callaghan (2011). Depending on the population category applied, koala activity is described as 0%, 'low', 'moderate', or 'high'.
- Role/importance of species population on site – the extent to which the site is considered a key source population for breeding, dispersal, is necessary for maintaining genetic diversity or near the limit of the species' range.

For subjective criteria where it is unclear whether a particular attribute score is achieved, the precautionary approach is applied to favour the higher score. **Table 9** outlines the attributes utilised to assess species stocking rate.

Table 9: Koala Species Stocking Rate Scoring

Attribute	Scoring and criteria				
<i>Presence detected on or adjacent to site (neighbouring property with connecting habitat)</i>	Score (/10)	0	5	10	
		No	Yes – adjacent to site	Yes – on-site	
<i>Species usage of the site (foraging and breeding habitat availability)</i>	Score (/15)	0	5	10	15
		Not habitat	Low	moderate availability	high availability
<i>Approximate density (per ha)</i>	Score (/30)	0	10	20	30
		0%	Low	Medium	High
		0	5	10	15



Attribute	Scoring and criteria				
<i>Role/importance of species population on site*</i>	Score (/15)	0	5-15	20-35	40-45
<i>Total SSR</i>	/70				
<i>SSR Score</i>	/4				

The impact site Assessment Unit is summarised in **Table 10** and displayed on **Plan 2**. Site condition was measured through the completion of habitat quality transects. Assessment at multiple locations per AU, except where the small size of an AU does not allow for multiple transects, is necessary to measure vegetation condition at representative locations across the spatial extent of the assessment unit. The locations of MHQA transects within the impact area are provided on **Plan 2**. Transect sites and assessment units are detailed in **Table 10**.

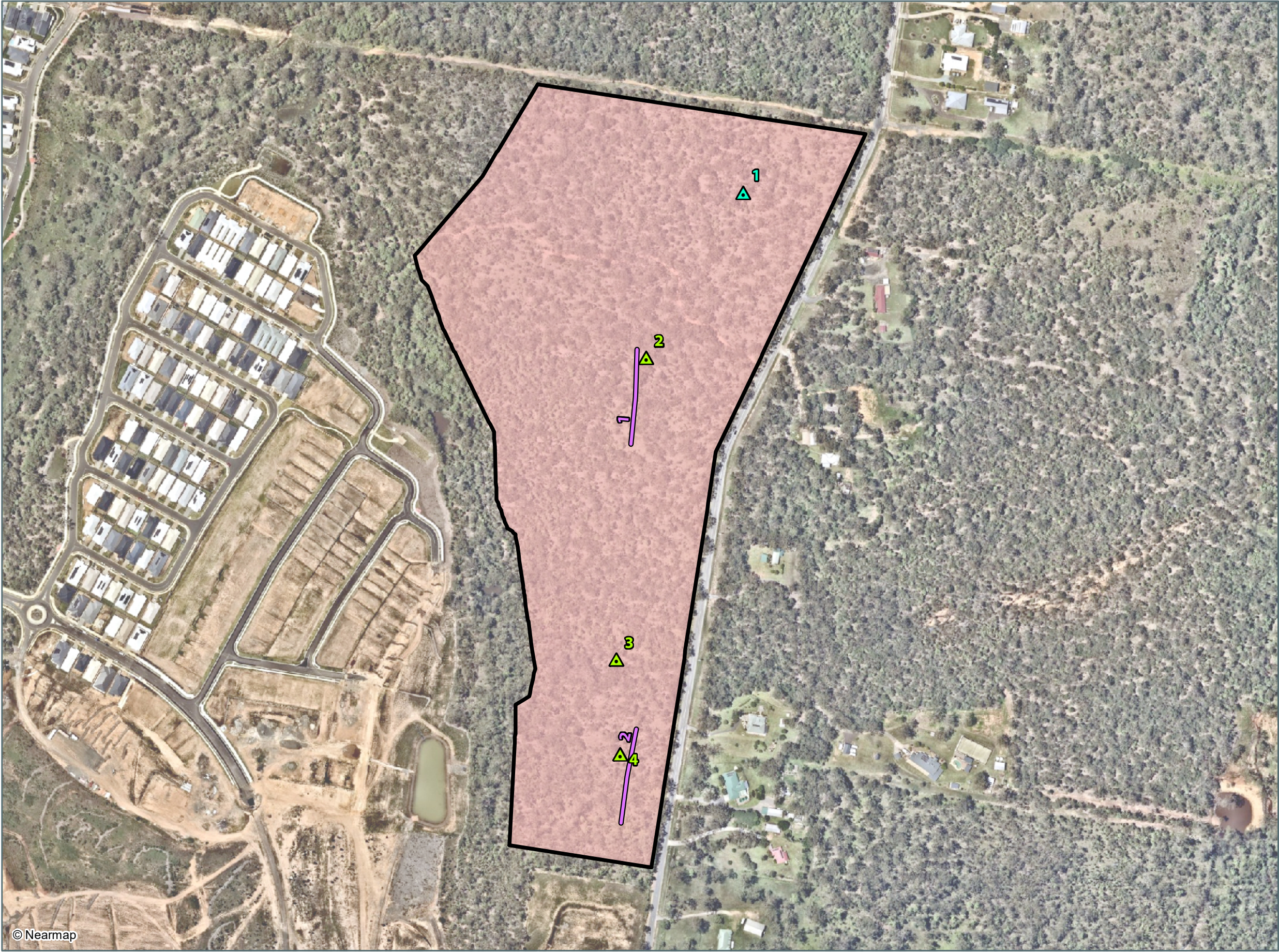
Table 10: Summary of assessment units and MHQA transects – impact site

Assessment unit	Vegetation community	VMA Category	Impact area (ha)	MHQA transect
AU1	RE12.9-10.2 (remnant)	Category B	19.1	Transects 1 and 2

Results of context methodologies shown on the Koala Context Assessment presented on **Plan 3** and **Plan 4**. Impact site ecological corridors presented on **Plan 5**.



02. IMPACT SITE ASSESSMENT UNITS AND MHQA TRANSECT LOCATIONS



Notes:
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LEGEND

Impact site

Assessment Unit 1 - Remnant RE 12.9-10.2

Habitat Quality Transect

SAT survey

SAT Survey (2022) Results - Low

SAT Survey (2022) Results - Nil



03. IMPACT SITE KOALA CONTEXT ASSESSMENT



Notes:
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LEGEND

- Qld DCDB
- Impact site
- Major & Arterial Roads
- 1km Impact site buffer
- Percentage of impact site boundary supporting a Koala critical habitat connection off and on site - 63%
- Percentage of Koala critical habitat within 1km of impact site (49%)
- Size of Koala critical habitat patch adjoining impact site (85 ha)



04. IMPACT SITE MHQA KOALA THREATS ASSESSMENT



Notes:
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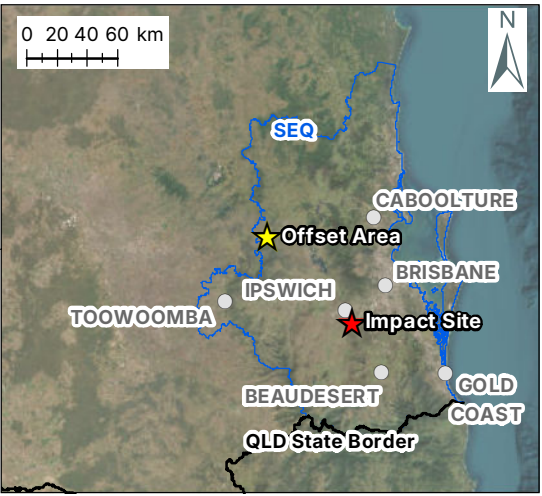
Layer Sources
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LEGEND

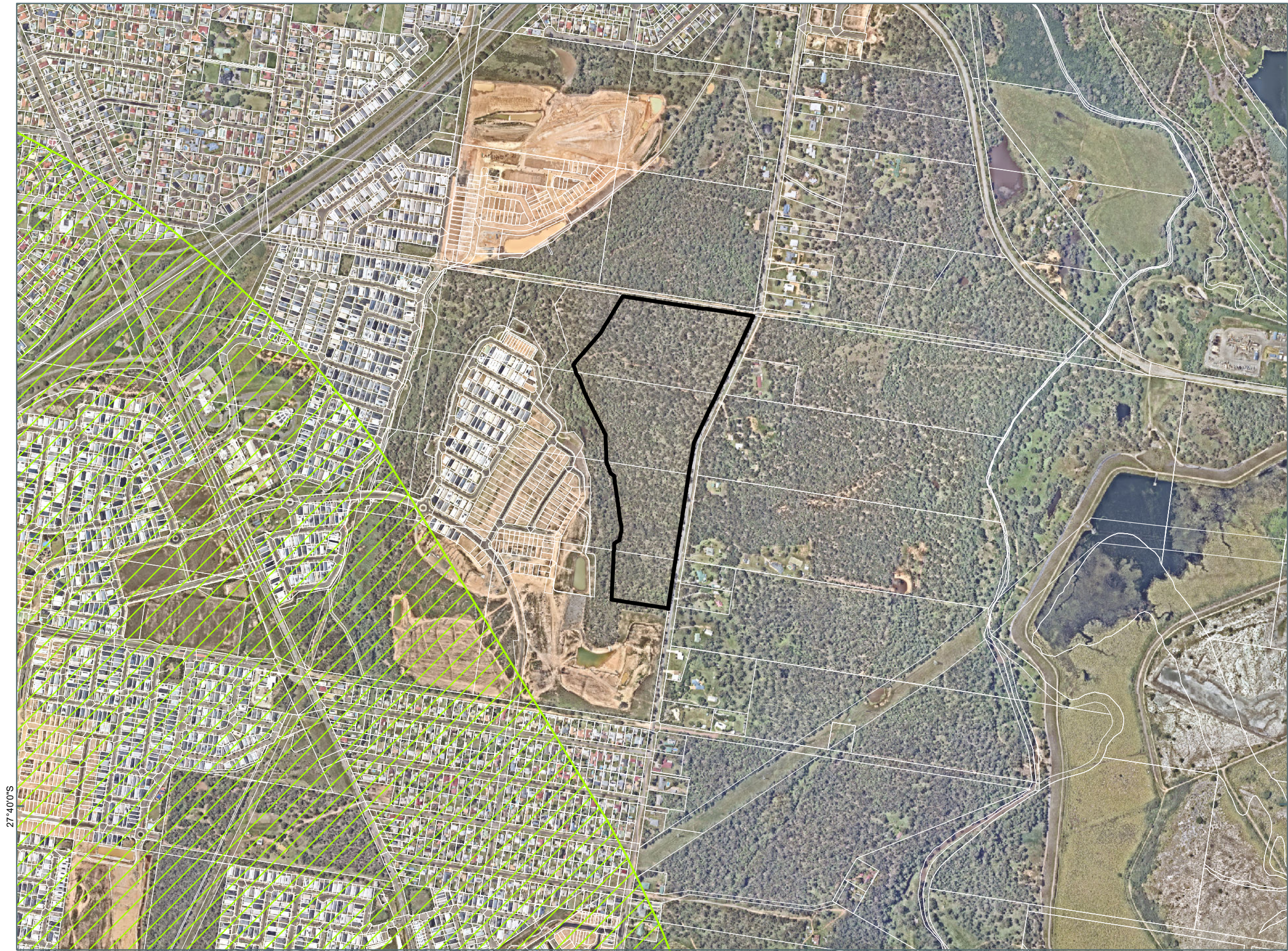
- Impact site
- Impact Area 5km buffer
- Major Roads and Tracks
- Minor and Unsealed Roads/Tracks
- Non-Koala habitat areas and degraded habitat within 5km of offset area (57%)

Koala Hospital Data (2023)

- Deceased (42)
- Injured (19)
- Sick and/or wasted (46)
- Sick & Injured (3)
- Orphaned Joey (2)
- Vehicle hit (58)



05. IMPACT SITE ECOLOGICAL CORRIDORS

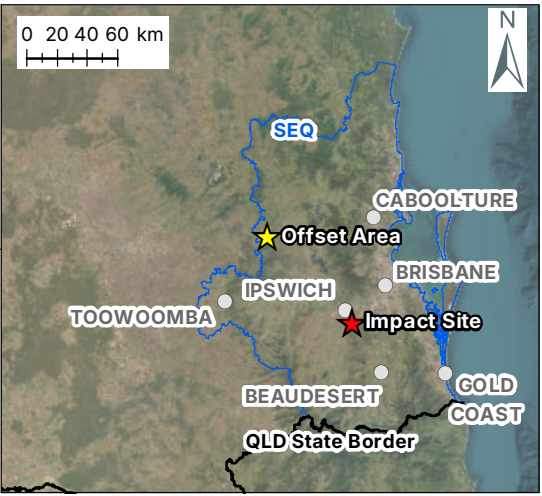


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LEGEND

- Qld DCDB
- Impact site
- SEQ Regional Plan 2017 Reigonal Biodiversity Corridor
- Regional Significance
- State Significance



3.3.2 Koala Discussion

The koala habitat quality score for the single AU was determined using a combination of Site Condition, Site Context, and Species Stocking Rate technical data and scoring. The score for Site Condition was derived directly from the MHQA tool data. The site was given an overall weighted habitat quality score of **6.25** out of the total of **10** (rounded to **6**).

Refer to **Table 11** for a summary of the results. The complete raw data are provided at **Appendix A**.

Table 11: *Impact site Koala MHQA final weighted score summary*

MHQA Final Weighting	AU1
Site Condition (/3)	2.47
Site Context (/3)	1.50
Species Stocking Rate (/4)	2.29
Assessment Unit Area (Impact) (ha)	19.1
Size Weighting	1.00
Total Weighted Score (/10)	6.25 (rounded to 6)

Site Condition (30%)

The site is mapped entirely as remnant habitat with one 'Least Concern' RE 12.9-10.2 accounting for 18.55 ha and one 'Of Concern' Composite RE 12.9-10.2/12.9-10.7/12.9-10.16 accounting for 0.55 ha, with the 'Of Concern' Composite RE is less than 1 hectare and is indicative of RE 12.9-10.2, therefore, the site contains only one (1) Assessment Unit. Two (2) transects were completed in AU1 while due to the small area of the 'Of Concern' Composite RE observation points were taken. Assessment Unit 1 scored a total of **2.47** out of **3** for Site Condition.

As per the methodology for Quality and Availability of Food and Foraging Habitat, and Quality and Availability of Shelter the site scored a **40** out of **40** for each value (refer **Appendix A**).

Site Context (30%)

The site scored a Site Context with a score of **1.50** out of **3** (**Plan 3** and **Plan 4**).

Size of patch

This attribute is a measure of the size of the patch of vegetation in which the assessment unit is located. The scoring reflects the importance of large patches in the landscape and is based on the size of the patch of critical Koala habitat connected to the site in this instance. This attribute reflects that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS and determined the referral area to be part of a patch size of larger than 1,000 ha due to the retained vegetation to the east. This achieved a score of **10** out of **10** (>200 ha Koala Habitat as per the *Queensland BioCondition Assessment* methodology) (**Plan 3**).



Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected to adjacent native vegetation. Connectedness relates to the capacity of the species to disperse through the landscape between sustainable patches of habitat and therefore has important implications for species persistence. Connectedness was calculated using GIS, with the percentage of referral area boundary length supporting a Koala critical habitat connection off and on site calculated at 63% (62.8%), and consequently this attribute scored a **4** out of **5** as per the *Queensland BioCondition Assessment* methodology (**Plan 3**).

Context

The context attribute refers to the amount of critical Koala habitat retained within a 1 km buffer of the proposed site and is calculated using GIS. Existing critical Koala habitat as defined by the EPBC Act within a 1 km buffer of the site was calculated at 49% (49.1%), and therefore the context attribute achieved a score of **4** out of **5** as per the *Queensland BioCondition Assessment* methodology (**Plan 3**).

Ecological Corridors

GIS was utilised to identify the role of the site in any ecological corridors on or adjacent to the site. A score of **0** out of **6** was given to the Ecological Corridors component of Site Context (30 %). The impact site is not located within an Ecological Corridor or corridor buffer area (refer **Plan 5**).

Role of site location to species overall population in the State

This attribute aims to quantify the importance of the site for state Koala populations through a combined approach that considers the activity and usage across the site and the importance of the habitat for fulfilling the Koala's life cycle (*i.e.*, foraging and breeding) and thus the effect that removal of this habitat would have on a local population and the species as a whole. This attribute was assigned a score of **5** out of **5** due to the presence of key values to support the Koala.

Threats to the species

The 'threats to the species' attribute quantifies potential risks to the survival of Koala existing within and adjacent to the referral area as per the threats matrix. Key known threats to the survival of the Koala include predation by wild or domestic dogs. This attribute was scored a **1** out of **15** as per the threats matrix analysis (refer **Appendix A** and **Plan 4**).

Species mobility capacity

Species mobility capacity is used to quantify the ability of the species to move from the site and through the surrounding landscape to meet survival needs. Species mobility capacity is considered particularly important in response to rapid changes to the surrounding environment, such as the commencement of land clearing. The Koala is considered a relatively immobile species, requiring land for movement, and covering relatively small distances on-ground compared to other highly mobile fauna.

The species mobility capacity for the Koala has been assigned the score of **4** out of **10** for the assessment unit as per the methodology (refer **Appendix A**).



Species Stocking Rate (40%)

The final component of the MHQA technique is SSR. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. Presence of this species was detected on site, meaning presence and foraging and breeding, therefore the species usage attribute for the site was uniform across the assessment units. A Species Stocking rate of 40 out of 70 was attributed to the site equating to a score **2.29** out of **4**.

Total quantum impact – Koala

The impact area will result in an impact of **19.1 ha** of vegetation identified as critical habitat for the Koala. With a weighted habitat quality score rounded to **6**, therefore there is an overall Quantum Impact of **11.46 ha**.

3.3.3 Grey-headed Flying Fox – Foraging Habitat Assessment Tool

The impact area has been assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by Saunders Havill (2019) which adopts characteristics of the Habitat Quality Guideline, while also integrating published scientific literature on GHFF foraging habitat.

The traditional terrestrial habitat quality assessment assesses three (3) core indicators—site condition, site context and species habitat index.

The GHFF FHA tool combines the aspects of the three (3) core indicators and published scientific literature into two (2) (site condition and site context) with site condition being weighted with 40% and site context weighted at 30% of the final score. The balance of the weighting (30%) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate assessment incorporated in the GHFF FHA tool is focussed on 'foraging habitat' for GHFF rather than GHFF stocking rates (presence/absence of the species). This assessment of 'foraging habitat' for species stocking rate has been incorporated in the GHFF FHA tool as grey-headed flying-fox roosting camp or species presence was not observed on-site, however, suitable foraging habitat for the species was evident. Therefore, the density of foraging habitat available on-site is considered an appropriate assessment benchmark for species stocking rate.

The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the GHFF FHA.

Site Condition (40%)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset property is suitable to establish a desired capacity to support the prescribed environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community and is benchmarked against the range for a relatively undisturbed community.

The site condition assessment under the GHFF FHA is assessed using six (6) condition characteristics being:



- Vegetation condition;
- Species richness (canopy trees);
- Flower scores (average);
- Timing of biological shortages;
- Quality of foraging habitat (trees >0.65 wt p*r); and
- Non-native plant cover.

Site condition under the GHFF FHA was assessed at the habitat quality transect locations within the impact assessment units summarised in **Table 10**. The locations of MHQA transects within the impact area are provided on **Plan 2**.

Assessment methodology of the above condition characteristics is outlined below:

- Vegetation condition – This condition characteristic is assessed using the Queensland *Vegetation Management Act 1999* vegetation community status definition, being Category B (remnant), Category C (high-value regrowth) and Category X (non-remnant). This characteristic is scored from a desktop mapping perspective and verified on-ground during assessment. Refer to **Table 12**.
- Species richness (canopy trees) – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. Within the plot, all canopy tree and subcanopy tree specimens are recorded. It should be noted that non-GHFF foraging species are also documented. Refer to **Table 13**.
- Flower scores (average) – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed Flying-fox* (DAWE, 2021) and determining the flower score of the recorded canopy species. The individual score for each flowering GHFF foraging tree is then divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The benchmark values for this condition characteristic have been derived from the findings published by Eby and Law (2008) (*Ranking the feeding habitat of Grey-headed flying foxes for conservation management*). Refer to **Table 14**.
- Timing of biological shortages – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of GHFFs for conservation management* (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed flying-fox* (DAWE, 2021) and determining the ability of the canopy species in the vegetation community to produce foraging habitat during biological shortages (food shortages, pregnancy and birthing, lactation, mating and conception, migration paths and fruit industries). It should be noted that this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue. Refer to **Table 15**.



- Quality of foraging habitat – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within Ranking the feeding habitat of GHFFs for conservation management (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed flying-fox* (DAWE, 2021) and determining which canopy species recorded contain a flower score greater than 0.65 wt p*r and is recognised as a significant food plant by Eby and Law (2008). It should be noted that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given its importance as a winter flowering species as acknowledged in the *National Recovery Plan for the Grey-headed Flying-fox* (DAWE, 2021). Refer to **Table 16**.
- Non-native plant cover – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. All non-native plant cover was assessed by estimating the cover of exotic species over the 100 m X 20 m plot. Refer to **Table 17**.

It should be noted that for on-ground assessment purposes, the 100 m X 20 m plot utilised for the GHFF FHA overlaps with the on-ground condition characteristics of the Koala MHQA.

Table 12: GHFF FHA Vegetation Condition Scoring

Score	Description
5	Category X / non-remnant
10	Category C / regrowth
20	Category B / remnant

Table 13: GHFF FHA Species Richness Scoring

Score	Description
0	0 GHFF foraging species
5	1 – 3 GHFF foraging species
10	4 – 6 GHFF foraging species
20	> 6 GHFF foraging species

Table 14: GHFF FHA Flower Score (average) Scoring

Score	Description
2	0.01 – 0.25



Score	Description
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00

Table 15: GHFF FHA Timing of Biological Shortages Scoring

Score	Description
2.5	Food shortages
1.5	Pregnancy and birthing
1.5	Lactation
1.5	Mating and conception
1.5	Migration paths
1.5	Fruit industries
Total (/10)	Combine total of above

Table 16: GHFF FHA Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring

Score	Description
0	0 significant GHFF foraging tree species
5	1 – 3 significant GHFF foraging tree species
10	4 – 6 significant GHFF foraging tree species
20	> 6 significant GHFF foraging tree species

Table 17: GHFF FHA Non-Native Plant Cover Scoring

Score	Description
1	> 50 % non-native plant cover
5	25 – 50 % non-native plant cover
10	5 – 25 % non-native plant cover
20	< 5 % non-native plant cover



Site Context (30%)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the GHFF FHA, site context is measured using the following six (6) characteristics:

- Size of patch;
- Connectedness (active GHFF roost camps in a 20 km radius);
- Context (percentage of GHFF foraging habitat in a 20 km radius);
- Ecological corridors;
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius); and
- Threats to the species.

The assessment methodology of the above context characteristics is outlined below:

- Size of patch – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the directly connected patch of GHFF foraging habitat to site measured. This context characteristic is measured using GIS. The benchmark values for this context characteristic are those used in the traditional habitat quality assessment. Refer to **Table 18**.
- Connectedness – This context characteristic is assessed by analysing the number of active GHFF roost camps (over the past year of monitoring (2023-2024)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government). Refer to **Table 19**.
- Context – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the percentage of GHFF foraging habitat within a twenty (20) kilometre buffer of the site measured. This context characteristic is measured using GIS. Refer to **Table 20**.
- Ecological corridors – This context characteristic is assessed using the traditional habitat quality assessment methodology which involves determining the proximity of the site to state, bioregional, regional or sub-regional corridors. Refer to **Table 21**.
- Threats to species – This context characteristic is assessed by analysing the published scientific literature regarding threats to GHFF and determining the number and severity of the threatening processes observed at or adjacent to the site. Refer to **Table 22**.
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius) – This context characteristic is assessed by analysing the number of active GHFF roost camps level 3 or greater (over the past year of monitoring (2023-2024)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government). Refer to **Table 23**.



Table 18: GHFF FHA Size of Patch Scoring

Score	Description
0	< 5 hectares
2	5 – 25 hectares
5	26 – 100 hectares
7	101 – 200 hectares
10	> 200 hectares

Table 19: GHFF FHA Connectedness Scoring

Score	Description
0	< 1 active Grey-headed flying-fox camp within a 20 km radius
3	1 – 3 active Grey-headed flying-fox camp within a 20 km radius
6	4 – 6 active Grey-headed flying-fox camp within a 20 km radius
10	> 6 active Grey-headed flying-fox camp within a 20 km radius

Table 20: GHFF FHA Context Scoring

Score	Description
0	< 10 % Grey-headed flying-fox foraging habitat within a 20 km radius
3	10 – 30 % Grey-headed flying-fox foraging habitat within a 20 km radius
6	31 – 75 % Grey-headed flying-fox foraging habitat within a 20 km radius
10	> 75 % Grey-headed flying-fox foraging habitat within a 20 km radius

Table 21: GHFF FHA Ecological Corridors Scoring

Score	Description
0	Not within an ecological corridor
6	Sharing a common boundary with an ecological corridor
10	Within an ecological corridor



Table 22: GHFF FHA Threats to Species Scoring

Score	Description
1	High level threat to the species
5	Moderate level threat to the species
10	Low level threat to the species

Table 23: GHFF FHA Role of Site Location to Species Overall Population Scoring

Score	Description
1	1 – 2 active level 3 Grey-headed flying-fox camp within a 20 km radius
6	2 – 4 active level 3 Grey-headed flying-fox camp within a 20 km radius
10	> 4 active level 3 Grey-headed flying-fox camp within a 20 km radius

Results of the prescribed methodologies are shown on the GHFF Context Assessment presented as **Plan 7**. Site ecological corridors presented on **Plan 5**.

Species Stocking Rate (30%)

The GHFF FHA incorporates SSR as an attribute not discussed under the traditional terrestrial habitat assessment methodology. As discussed above, SSR for GHFF associated with this proposed action is related to the density of GHFF foraging habitat at the site at the time of undertaking the survey.

Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology modified from the Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland (version 5.0) (Neldner et al. 2019).

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. The stem density of canopy species recorded within the 0.2 ha plot is multiplied by five (5) to produce a stem density per ha. This number is then compared to the benchmark stem density per ha based on the sum of the T1 stem density taken from the relevant regional ecosystem technical description as per the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019). Refer to **Table 24** for benchmark scoring values for species stocking rate.

Table 24: GHFF Species Stocking Rate Scoring

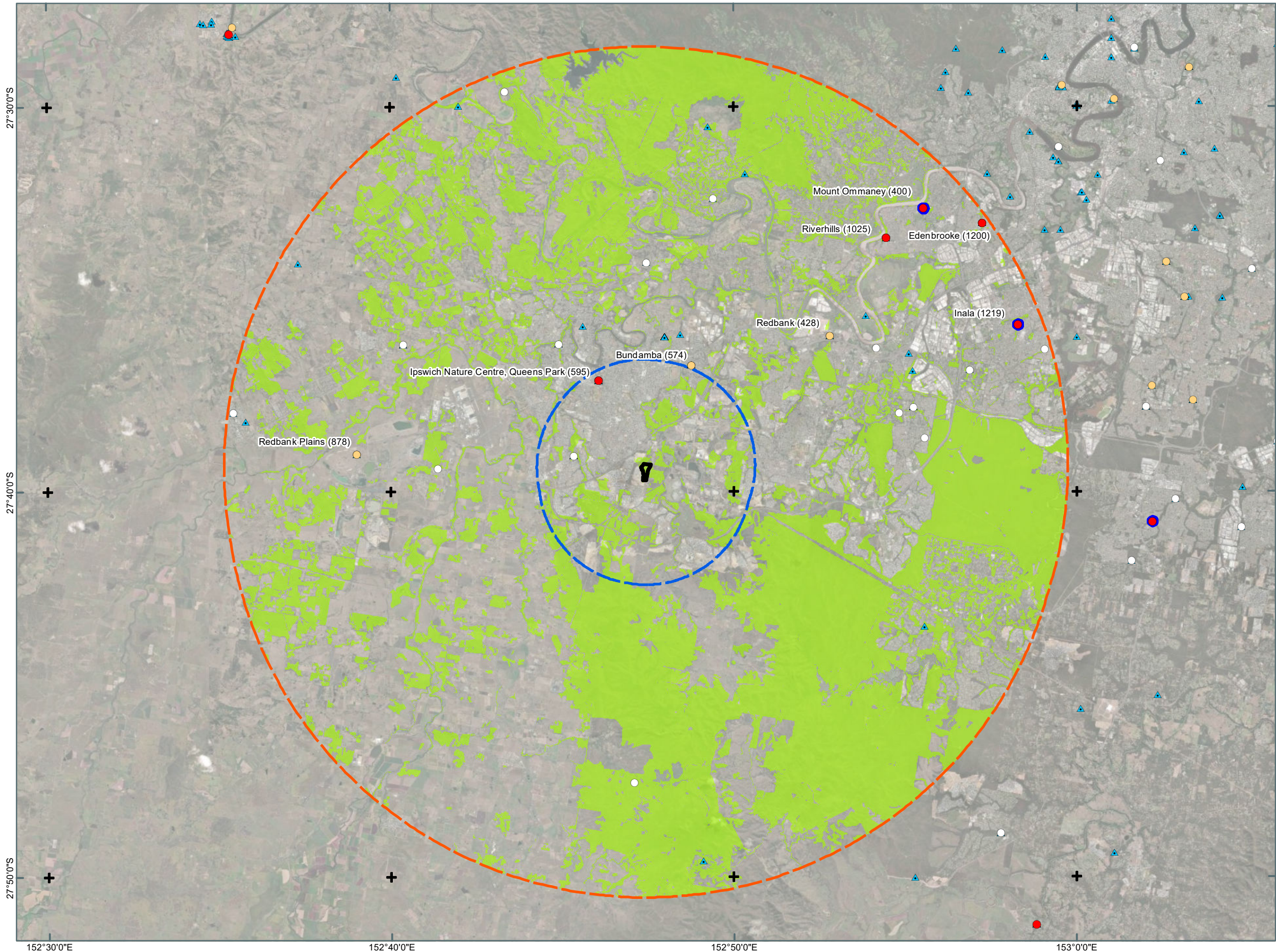
Score	RE12.9-10.2
2	0-30



Score	RE12.9-10.2
4	31-130
6	131-220
8	221-325
10	236-245
8	246-260
6	261-350
4	351-450
2	>450



06. IMPACT SITE GHFF CONTEXT ASSESSMENT

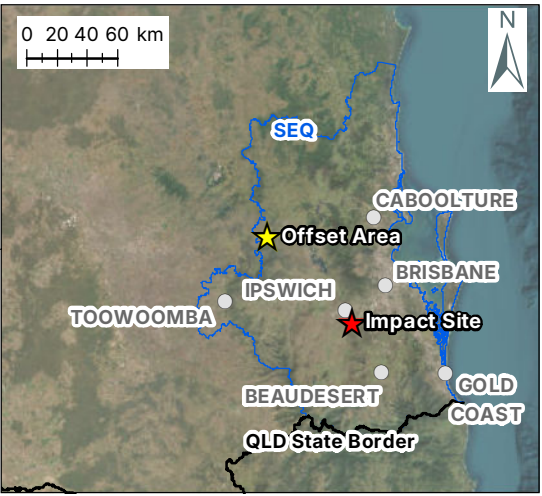


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LEGEND

- Qld DCDB
- Impact site
- 5km Impact site buffer
- 20km Impact site buffer
- Potential and known Grey-headed Flying-fox foraging habitat within 20km of impact site - 39%
- Grey-headed Flying-fox records within 20km of impact site recorded within past 20 years [ALA, 2026 - 197]
- GHFF Roosts (Fed. Gov., 2026)**
 - Grey-headed Flying Fox roost inactive within recent surveys [15]
 - Grey-headed Flying Fox roost active within recent surveys [3]
 - Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [3]
 - Nationally significant Grey-headed Flying Fox roost active within recent surveys [0]
 - Nationally significant Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [2]



3.3.4 Grey-headed Flying-fox Discussion

Refer to **Table 25** for a summary of the impact site GHFF FHA results.

Table 25: Impact area grey-headed flying-fox – FHA assessment summary

MHQA Final Weighting - GHFF	AU 1
Site Condition (/3)	2.60
Site Context (/3)	2.05
Species Stocking Rate (/4)	1.20
Assessment Unit Area (Impact) (ha)	19.1
Size Weighting	1.00
Total Weighted Score	5.85 (6)

Site Condition (40%)

The baseline site condition characteristics for grey-headed flying-fox are summarised in **Appendix B**.

Site Context (30%)

The baseline site context characteristics for grey-headed flying-fox are shown on **Plan 6** with results summarised in **Appendix B**.

A 'moderate' level of threats to GHFF are present within the offset area including the presence of barbed wire.

Species Stocking Rate (30%)

The baseline species stocking rate scores is determined by the stem density of GHFF foraging species. The offset area species stocking rate results for grey-headed flying-fox are summarised in **Appendix B**.

Total quantum impact – Grey-headed Flying-fox

The impact area will result in an impact of **19.1 ha** of vegetation identified as critical habitat for the Grey-headed Flying-fox. The impact site attained a score of **5.85** out of **10**.



4. Overview of Offset Area

4.1. Offset Property Description and Tenure

The proposed offset area (refer **Figure 3** and **Figure 4**) is located at 1942-1958 Esk Crow's Nest Road, Biarra, Queensland, 4313 (described as Lot 214 CA 311183, Lot 42 CA 31692, Lot 140 CA 31918, Lot 213 CA 31970, Lot 97 RP 215969, Lot 2 RP 223480 and Lot 2 SP 269793), within the Somerset Regional Council (SRC) Local Government Area, approximately 18 km north-west of the Queensland town of Esk. The proposed offset area comprises part of Lot 2 on SP269793 and Lot 7 on RP215969. The offset area is located approximately 74 km north-west of the proposed impact area (refer **Plan 7**). The offset area is contained to the same sub-bioregion as the impact site and supports like-for-like Regional Ecosystems that provide habitat for the target MNES. The offset area is currently zoned as 'Rural' under the Somerset Regional Council (SRC) Planning Scheme. Key details relating to the offset area are provided in **Table 26**.

Table 26: Willowvale Offset Area summary

Address	1942-1958 Esk Crow's Nest Road, Biarra, Queensland, 4313
Lot / Plan	Part of Lot 2 on SP269793 Part of Lot 97 on RP215969
Area	Approximately 100.8 ha
Tenure	Freehold
Local Government Area	Somerset Regional Council

The proposed offset area forms part of the broader Willowvale Offset Property, which totals >620 ha (refer **Figure 4**). The proposed offset area contains both non-remnant (approximately 86 ha) and remnant vegetation (approximately 14 ha) with the latter mapped as RE12.12.7/12.12.8 (55/45%) and RE12.12.5 under the VMA. A review of historical aerial imagery was undertaken to assist with the broad delineation of vegetation communities and identification of historical land management patterns that potentially affect current local vegetation values (refer **Plan 8**). The offset area has been historically cleared since before the late 1950's with agricultural uses and associated land management continuing to the current day.

The understory of the offset area is largely disturbed as a result of intense grazing activities and dominated by pasture grasses. Weeds were recorded across the offset area including *Heliotropium amplexicaule* (blue Heliotrope), *Gomphocarpus physocarpus* (Balloon Cotton Bush), *Hydrocotyle acutiloba* (Pennywort), *Bidens pilosa* (Cobbler's Pegs), *Crassocephalum crepidioides* (Thickhead), *Cirsium vulgare* (Spear Thistle), *Sida rhombifolia* (Arrowlead Sida), *Argemone Mexicana* (Mexican Poppy) and *Melinis repens* (Red Natal Grass). WONS were where present included *Lantana camara* (Lantana).

The proposed offset area is considered to have the capacity to meet the offset requirements given the location of the area amongst the greater offset property and the presence of Koala trees and sighting records in the area. The proposed offset area can act as receiving area for rehabilitation and the creation/improvement of habitat value. Additionally, this offset area sits in the south-western extent of

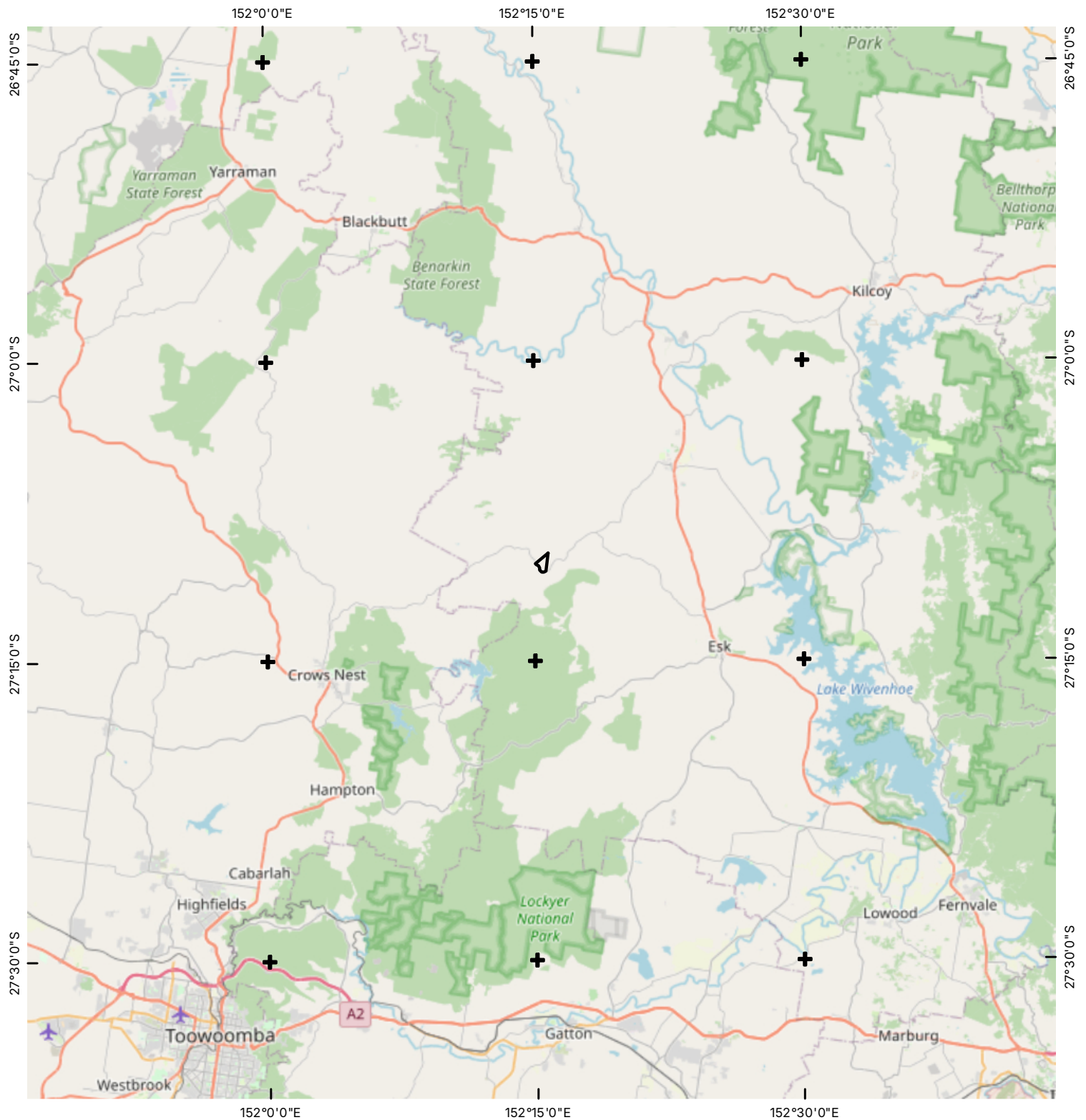


KFF's Willowvale Offset Property partially within a State/Regional Biodiversity Corridor with current approved offsets mapped as Category A located approximately 7 km to the south-east and approximately 9 km to the north.

In addition, the location of the proposed offset area near to a State/Regional Biodiversity Corridor and within the same sub-bioregion as the impact area ensures the land will continue to provide habitat and fauna connectivity within the greater landscape.

Upon EPBC Act Approval, the offset will be protected by the mechanism chosen by DCCEE. This will be via a Voluntary Declaration under the *Vegetation Management Act 1999* followed by a permanent securing mechanism agreed with the Department, which will provide protection for the duration of the impact. An assessment of the suitability of the proposed offset area is provided in **Section 5**.





LEGEND

 Offset Area

FIGURE 3

OFFSET SITE CONTEXT

PROJECT
RIPLEY ROAD, RIPLEY
COORDINATE SYSTEM
GDA 2020 MGA Z56
SCALE (A4)
1:500,000

0 2 4 6 8 10 km



CLIENT

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FILE REFERENCE

10835 E Figure 3 Off Site Context A

DATE 24/11/2025



LEGEND

- Qld DCDB
- Offset Property [626.2 ha]
- Offset Area [100.8 ha]

FIGURE 4

OFFSET SITE AERIAL

PROJECT
RIPLEY ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:22,500

0 200 400 600 800 m



CLIENT

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10835 E Figure 4 Off Site Aerial A

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07. OFFSET AREA CONTEXT



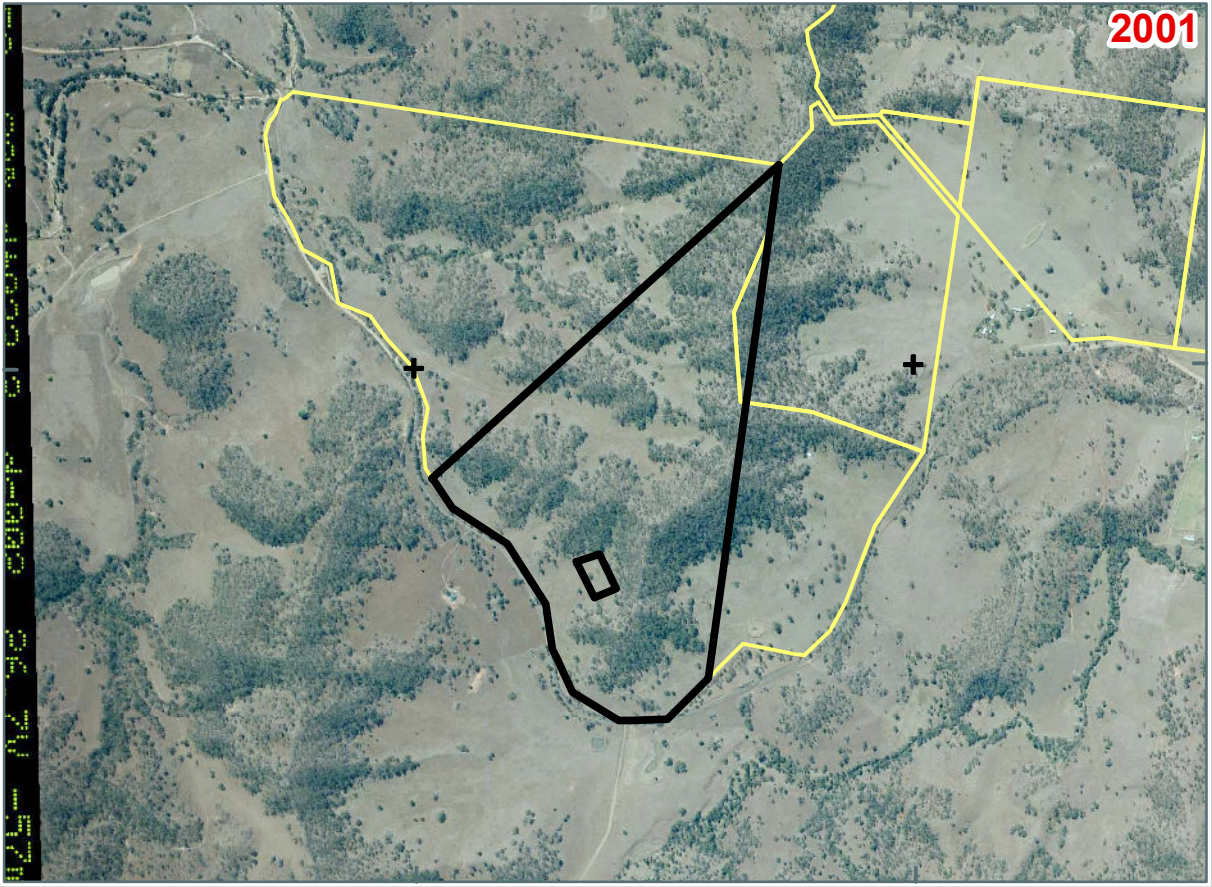
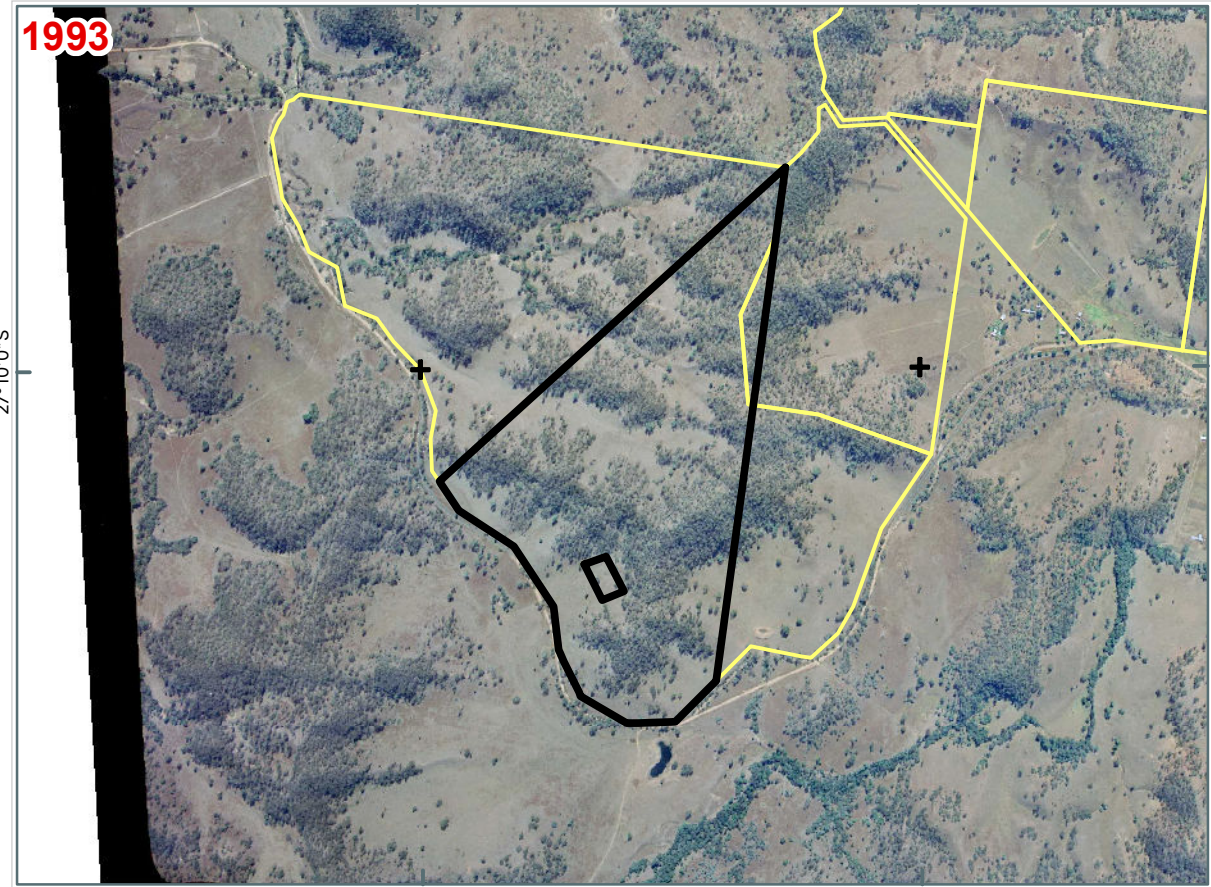
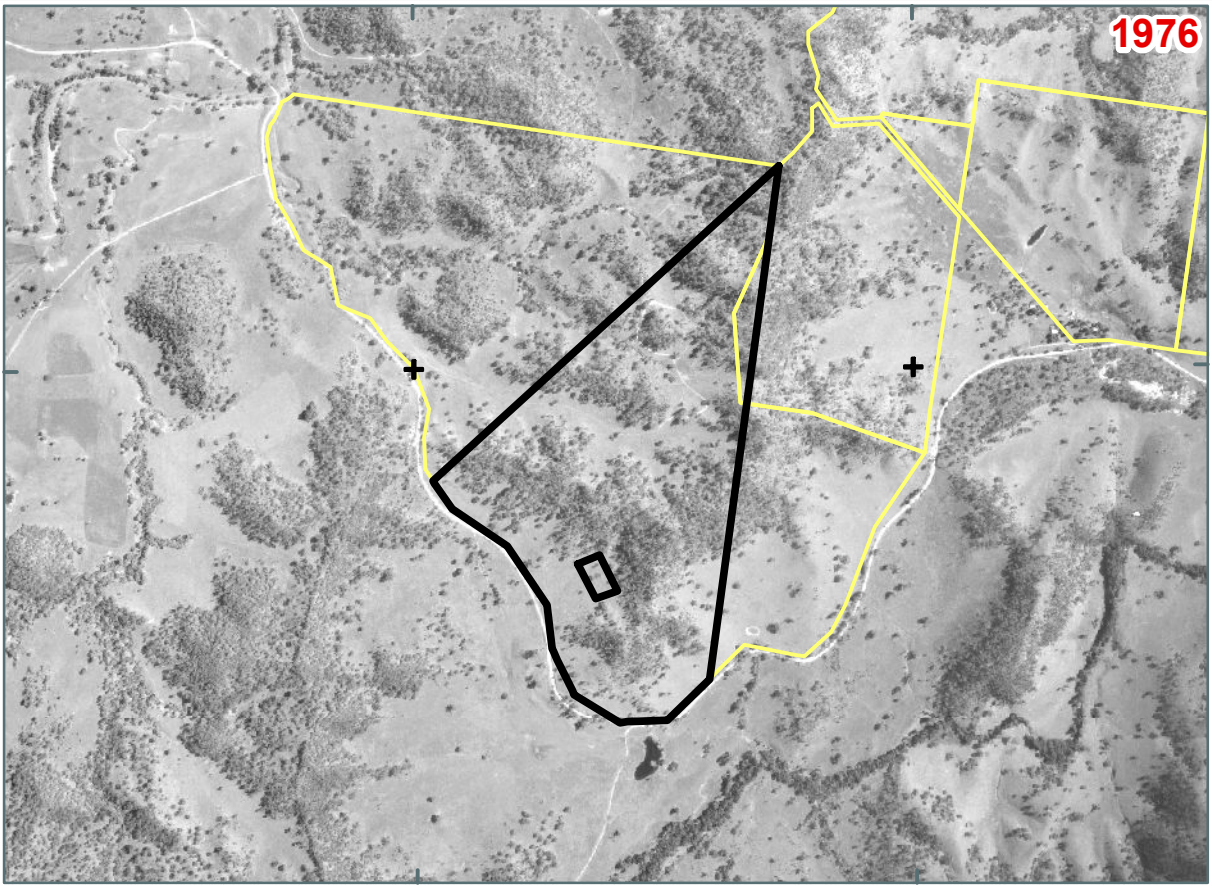
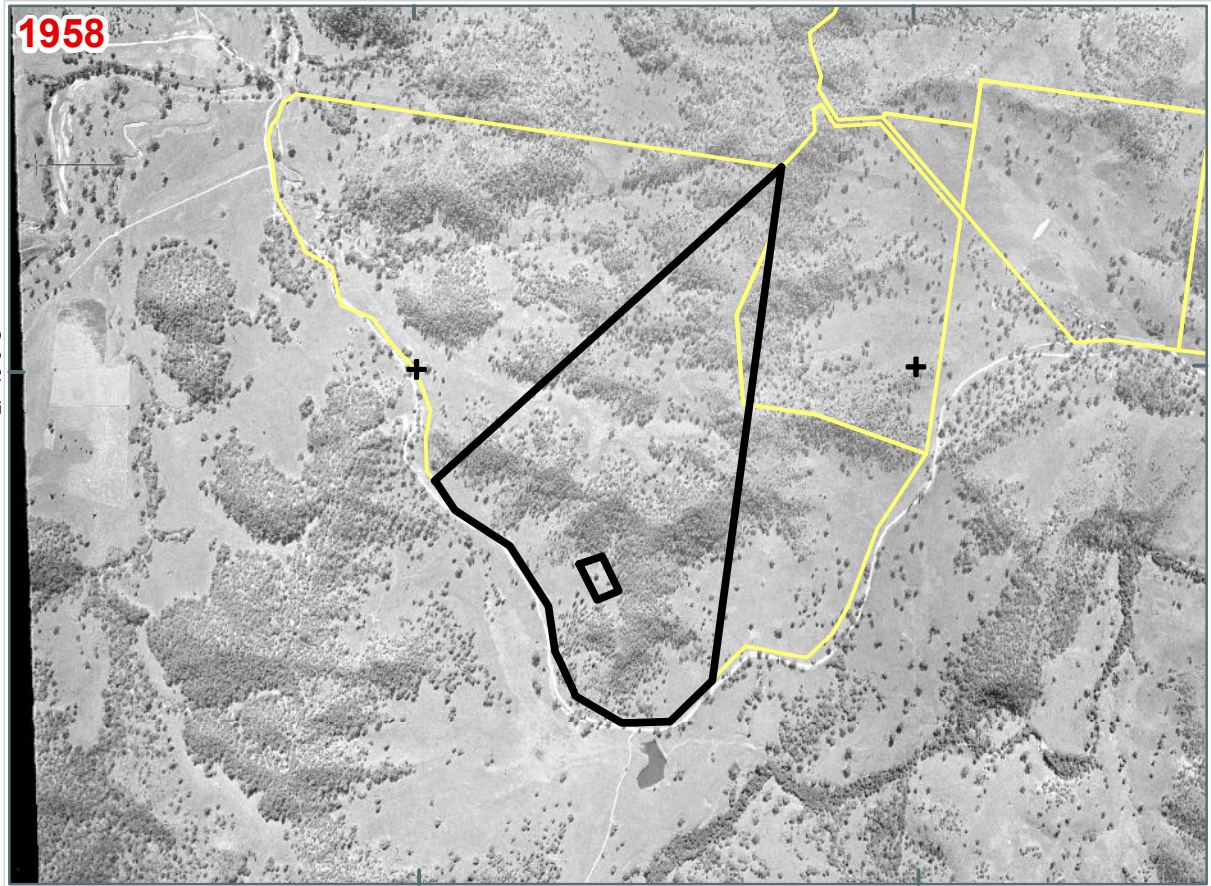
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- LEGEND
- Offset Area [100.8 ha]
 - Impact site



08. OFFSET AREA HISTORICAL AERIAL IMAGERY



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LEGEND

- Offset Property
- Offset Area



5. Offset Area Suitability

As detailed in **Section 4**, one (1) offset area has been selected to wholly acquit the impacts to MNES proposed under the EPBC application (EPBC 2021/9070) and provide benefit additional to the required compensation for residual impacts. The suitability of the proposed offset area is discussed within this section and considers the bioregional context of the site, ecological values, water resources and topography, and existing habitat values for Koala.

5.1. Bioregional Context

Queensland is divided into 13 biogeographical areas to identify biodiversity features at a regional scale. The proposed offset area is located in the South East Queensland (SEQ) Bioregion. The SEQ Bioregion shares its western boundary with the Brigalow Belt Bioregion and extends from the Border Ranges on the New South Wales border, north to the dry coastal corridor between Gladstone and Rockhampton (DEHP 2016). The McPherson Range borders the southern boundary of the bioregion while the Great Dividing Range is to the west. Ranges extend north-south through the central region creating an altitudinal gradient from the coast. Small volcanic plugs remain in the landscape offering distinctive conditions for taxa and ecosystems (DEHP 2016). Large sand islands off the coast offer unique environments and create sheltered bays and passages within which marine and coastal plants and animals thrive (DEHP 2016). The impact area and proposed offset area are both in the same sub-bioregion, being the Moreton Basin.

5.2. Offset Area Values

5.2.1 Regional and landscape context

While the offset property is partially located within the Biodiversity Planning Assessment State/Regional Biodiversity Corridor, the offset area sits adjacent to this mapping. However, the offset area is located within the South East Queensland Regional Plan ('*ShapingSEQ 2023*'), Regional Biodiversity Corridor which spans from the Noosa headland in the north, down to Mount Barney and Lamington National Park on the Queensland border (refer **Plan 9**). The corridor aims to encompass large tracts of vegetation, terrestrial connectivity, aquatic connectivity, species richness, diversity and refugia, ecosystem representation and uniqueness and climate resilience areas (Queensland Government 2017).

The Regional Biodiversity Corridor forms part of the Great Eastern Ranges terrestrial corridor which extends from the mountains of Victoria to the Atherton Tablelands in far north Queensland (Mackay *et al.* 2010). The Great Eastern Ranges corridor provides habitat and movement for a range of species that have Federal, State and Local significance, supports significant cultural heritage values and offers scenic amenity and outdoor recreation opportunities (Mackay *et al.* 2010).

The proposed offset area will conserve freehold land within the Regional Biodiversity Corridor, extending the habitat within the legally bound environmental offset areas that are generally available around the remnant vegetation within the Regional Biodiversity Corridor. The proposed offset site is well positioned to provide high conservation values once rehabilitated through the management actions proposed in this OMP and contribute to the provision of protected, well-connected, and high-quality Koala habitat in the



region. By assisting the natural revegetation, replanting, and removing pests, weeds, and threats, the property will provide biodiversity offsets that ensure an ecological gain on the residual impacts resulting from the impact area which aligns with offset principle 1 of the EPBC Act Environmental Offset Policy (2012) (EOP).

5.2.2 Topography

The proposed offset area has varied topography characterised by open paddock and gently sloping hills. The topography of the proposed offset area ranges from 265 m Above Sea Level (ASL) within the central gully lines, within the higher points to 340 m ASL within the northern area of the site. Refer to **Plan 10**.

5.2.3 Water resources

The proposed offset area contains several unmapped features of Anduramba Creek in the west and Oaky Creek in the east. A number of these features are also mapped as stream order 1 watercourses under the VMA.

5.2.4 MNES habitat

The proposed offset area comprises predominately Category X (non-remnant) vegetation which is mapped as a composite pre-clear communities RE12.12.5/12.12.7/12.12.8. Several polygons of Category B (remnant) vegetation are mapped across the offset area, predominately being RE12.12.5 with a small portion mapped as RE12.12.7/12.12.8. The offset area contains scattered remnant polygons amongst regrowth Koala habitat trees and cleared open paddock areas. Species present are indicative of the vegetation communities described in **Table 27**.

Table 27: Regional ecosystem descriptions

Regional Ecosystem	Status	Description (Queensland Herbarium)
12.12.5	Least Concern	<i>Open forest to woodland of Corymbia citriodora subsp. variegata, usually with Eucalyptus crebra. Other species such as Eucalyptus exserta and E. moluccana present in scattered patches or in low densities. Understorey generally grassy. Occurs on hills and ranges on Mesozoic to Proterozoic igneous rocks. Not a Wetland. (BVG1M: 10b).</i>
12.12.7	Least Concern	<i>Eucalyptus crebra grassy woodland. Other species such as Corymbia erythrophloia, Eucalyptus exserta, E. tereticornis, C. tessellaris, C. citriodora subsp. variegata may be present in low densities or in patches. Mid-layer generally sparse but can include low trees such as Vachellia bidwillii, Alphitonia excelsa, Allocasuarina luehmannii and Petalostigma pubescens. Small areas of Callitris glaucophylla occur in central western parts of bioregion. Occurs on Mesozoic to Proterozoic igneous rocks. Not a Wetland. (BVG1M: 13c).</i>



Regional Ecosystem	Status	Description (Queensland Herbarium)
12.12.8	Of Concern	<i>Eucalyptus melanophloia</i> , usually with <i>E. crebra</i> +/- <i>Corymbia erythrophloia</i> grassy woodland. Other species such as <i>Eucalyptus exserta</i> , <i>E. tereticornis</i> , <i>C. tessellaris</i> , <i>C. citriodora</i> subsp. <i>variegata</i> may be present in low densities or in patches. Occurs on Mesozoic to Proterozoic igneous rocks. Not a Wetland. (BVG1M: 17b).

5.2.5 Current management arrangement

Presently, the proposed offset area is utilised for cattle grazing and is managed through various farming practices. This includes the use of the following management activities:

- Controlled grazing to ensure ground cover levels are maintained, subsoil moisture is retained, and pasture growth is encouraged
- Invasive and noxious weed control in grazing areas targeting WONS, and;
- Establishing and maintaining adequate firebreaks across the property.

5.2.6 Current threats

The broader Willowvale Offset Property currently and historically has been utilised for various agriculture activities, which attracts threats to both livestock and native wildlife. The major and obvious threat within the proposed offset area and broader offset property is the wild dog. The SRC lists wild dogs as abundant and widespread throughout the region and has also listed the species (*Canis familiaris dingo*, *Canis familiaris dingo* X *Canis familiaris*, *Canis familiaris*) as a declared pest animal. The SRC website documents that wild dog numbers are at an all-time high across the SRC area. Further, residents are increasingly engaged in raising livestock and poultry, resulting in a readily available food sources for wild dogs.

The Queensland WildNet database identified two (2) confirmed sightings of wild dog (*Canis* sp. and/or *Canis familiaris*) and two (2) records of European red foxes (*Vulpes vulpes*) within 20 km of the proposed offset area. Wild dogs are known to travel up to 20 km seeking prey with home ranges of individuals likely to overlap with the offset area.

Presently, under the Queensland *Biosecurity Act 2014*, there is a 'general biodiversity obligation' for landholders to manage biosecurity risks that are under their control and take reasonable and practical steps in doing so. To determine the extent of management and whether it is necessary to take reasonable steps in managing the biosecurity risk, the landholder is required to assess the risk and its potential harm (*i.e.*, extensive productivity loss). Currently, the landholder does not undertake feral animal control as it is assessed under the 'general biosecurity obligation' of the *Biosecurity Act 2014*, that feral animal threat to productivity does not have a positive cost benefit to the current land use (*i.e.*, the expenditure to undertake feral animal control would not result in enough economic gain in productivity to warrant implementation).

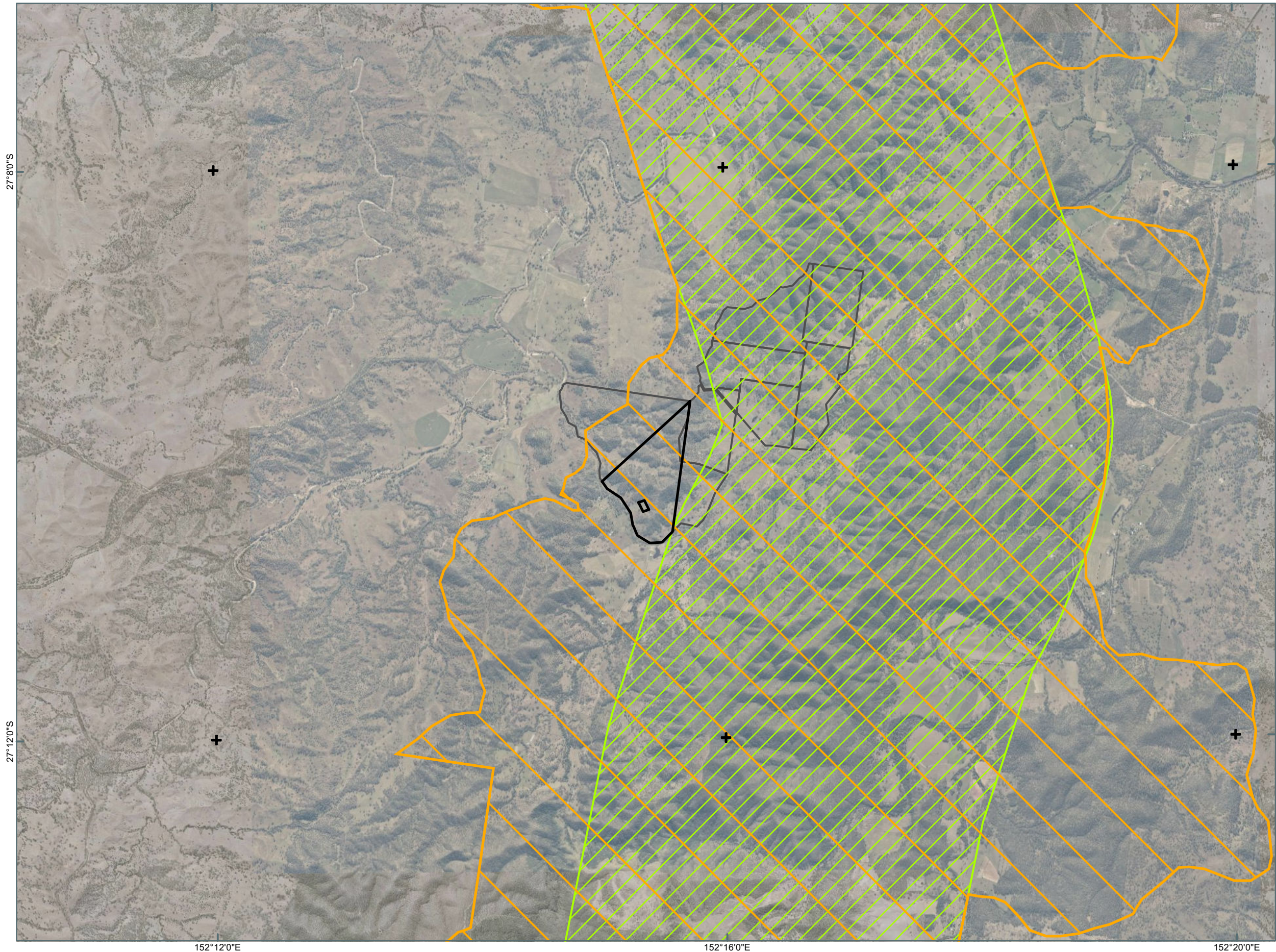


Additional threats include:

- clearing and harvesting of timber for pastoral uses
- uncontrolled wildfire,
- barbed wire fencing,
- significant weed infestations, in particular, *Lantana camara*.



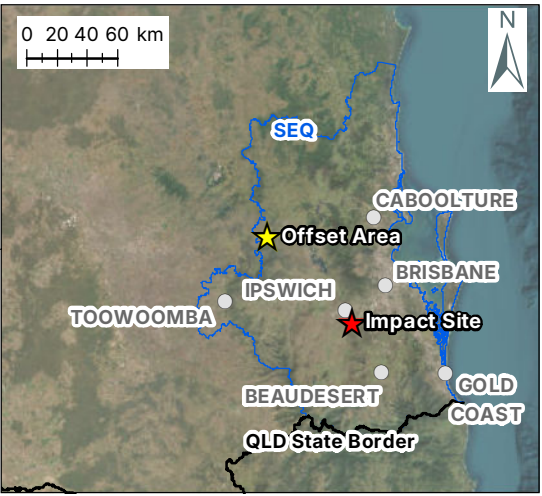
09. OFFSET AREA BIODIVERSITY CORRIDORS



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- LEGEND**
- Offset Property
 - Offset Area
 - SEQ Regional Plan - Regional Biodiversity Corridor
 - Regional Significance
 - State Significance



10. OFFSET AREA TOPOGRAPHY



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LEGEND

- Qld DCDB
- Offset Property
- Offset Area
- Contours (5m)



5.3. Suitability Analysis – Environmental Offset Policy

The objective of this OMP is to outline appropriate management actions to achieve the offset outcomes specified within the EPBC Act and provide an overall improved conservation outcome and net gain in Koala habitat, thereby ensuring the long-term viability of this species. **Table 28** lists the principles of the EPBC Act EOP and describes how the proposed offset has been developed to adhere to these principles.

Table 28: Offset suitability analysis – Environmental Offsets Policy

EOP Requirements	Delivery
Suitable offsets must:	
Deliver an overall conservation outcome that improves or maintains the viability of the protected matter	The offset area will directly contribute to the ongoing viability of the Koala and GHFF. Protection, enhancement and management of the offset area in accordance with this OMP will deliver an overall conservation benefit and net gain in Koala habitat. The offset site was deliberately selected for its capacity for rehabilitation and revegetation and a conservation gain will be delivered through legally secured protection combined with active management and ecological process recovery. Prior to the impact, the offset area was not protected or managed for conservation outcomes. Actions outlined in this OMP will commence the regeneration and restoration of habitat, contributing to a connected corridor with reduced threats. In doing so, the OMP aims to encourage the use of restored and new areas of habitat through increasing the numbers and area of Koala and GHFF food trees, maintaining low abundance of weeds and reducing predator abundance. The proposed offset aims to contribute to the resilience of the Koala and GHFF by increasing landscape connectivity provided through the protection of the offset properties.
Be built around direct offsets but may include other compensatory measures	The offset is built around direct offsets and easily compensates for the potential impact. The offset area will be legally secured for conservation purposes prior to the impact occurring and will endure for the duration of the impact. Legally securing and managing the offset area in accordance with this OMP protects the areas from incompatible land uses and contributes to the viability of the Koala. The offset will be delivered entirely through direct, land based measures and no indirect or supplementary offsets will be relied upon.
Be in proportion to the level of statutory protection that applies to the protected matter	The OAG lists the probability of annual extinction of the Koala as 0.2% and GHFF at 0.2%. The use of this measurement in the OAG ensures that the appropriate level of statutory protection is applied. The EPBC listing status of the protected matter is directly linked to



EOP Requirements	Delivery
Suitable offsets must:	
Be of a size and scale proportionate to the residual impacts on the protected matter	the scale, duration and management intensity of the offset as set out in the OAG.
	All threats to Koalas outlined in the Department's Species Profile and Threats Database and EPBC Act Conservation Advice and Recovery plan for the Koala have been addressed within this OMP.
	Permanent protection and management until the proposed outcomes are achieved will deliver a conservation gain adequately compensating for the quantum impact for each matter. The total offset area for protection and management is 100.8 ha, delivering a 151.94% offset for the Koala and 170.73% offset for the GHFF, thus satisfying the 90% minimum direct offset area.
	Management actions outlined within this OMP aim to protect and enhance Koala and GHFF habitat, compensating for and exceeding habitat quality of the impact.
The offset and management actions will provide: • Legally secured and long-term protection of 100.8 ha of Koala habitat. • Improvement of habitat through revegetation and natural regeneration of Koala and GHFF food trees and removal of weeds. • Contribution to a large contiguous protected habitat and biodiversity corridor with reduced threats. • Long-term reduction in threats, through the removal of incompatible land uses. • Reduced risk of Koala mortality or injury due to vehicle strike. • Reduced risk of Koala and GHFF mortality or injury due to predators, through control of non-native predators, and removal or retrofitting of barbed wire fencing. • Reduced risk of high intensity fire through management of fuel loads. • Reduced risk of the spread of diseases and/or pathogens.	



EOP Requirements	Delivery
Suitable offsets must:	Importantly, ecological uncertainty around conservative gain estimations, staged targets and adaptive management are to be applied to manage risk over time and ensure the offset is delivered.
Effectively account for and manage the risks of the offset not succeeding	Confidence in the success of the offset is high ($\geq 75\%$) given the detail and intensity of the management actions outlined within this OMP. The confidence is supported by the offset area selection, design of management actions, and clear monitoring and reporting procedures. The offset area contains well-maintained access tracks that will facilitate access to planting areas. Risks associated with the offset delivery will be mitigated and managed through the detailed management actions outlined in Section 9. Management actions have been drawn from offset targets which aim to protect and conserve large, connected areas of Koala foraging habitat to support viable populations.
Be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs	Legally securing the offset area for the duration of the impact will ensure existing and future owners are prohibited from conflicting land uses, including clearing. Management beyond minimum legislative requirements is proposed across the whole area to ensure loss of habitat values does not occur through intensification of weeds causing loss of connectivity, destruction of habitat via hot, intense fires, or increased risk of mortality or injury by dog attack. The activities proposed under this OMP exceed standard duties of care and are undertaken solely because of the EPBC Act offset requirements.
Be efficient, effective, timely, transparent, scientifically robust, and reasonable	Efficient and Effective: - The offset area is surrounded by a landscape of connected Koala habitat, and more directly by potential habitat that is being actively rehabilitated as offsets. Management actions will ensure efficient delivery of outcomes over the offset area and proactive management, monitoring and reporting will ensure response/corrective actions are timely and focused. - Prior to the EPBC Act process, the offset area was not protected or managed for conservation outcomes. Protection and management of the offset area in accordance with this OMP aims to deliver an overall improved conservation outcome and net gain in Koala habitat.



EOP Requirements	Delivery
Suitable offsets must:	Timely: • The mix of paddock and scattered remnant vegetation within the offset area allows for the achievement of immediate and long-term conservation outcomes. The offset area will be legally secured prior to the commencement of clearing at the project site. • Following the approval and implementation of this OMP, management actions outlined within Section 9 will commence. Adaptive management processes will ensure management actions respond to technology improvements, natural events and potential risks identified in the risk assessment. Transparent: • The baseline surveys established the survey methodology to be used for the monitoring and reporting required for the lifetime of the approval. A clear monitoring and reporting framework is established within this OMP (refer Section 6.1). Monitoring and reporting of the offset area will be summarised within an Offset Area Annual Report provided by the Offset Provider which is then included in the Annual Compliance Reports for project. Scientifically robust: • The proposed offset area was assessed by suitable qualified and experienced Ecologists. Ongoing management and monitoring actions will be conducted in collaboration with other qualified Ecologists and regeneration specialists to achieve the outcomes specified within the EPBC Act approval and this OMP. • The baseline surveys conducted for the offset area follows standard, accepted monitoring methodology and are considered scientifically robust, reliable and repeatable. This will ensure the monitoring and compliance reporting are consistent and relate back to the overall outcomes specified within the EPBC Act approval. Reasonable:



EOP Requirements	Delivery
Suitable offsets must:	- The offset is considered reasonable as the offset areas are greater than the significant residual impact on all MNES (using the OAG). - This OMP outlines appropriate management actions to achieve the offset outcomes specified within the EPBC Act approval and an overall improved conservation outcome and net gain in Koala and GHFF habitat, ensuring the long-term viability of the protected matters. The offset is practical, deliverable within the proposed timeframes, and based on established, regulator endorsed methodologies. This OMP provides a detailed monitoring and reporting framework, performance criteria and corrective actions. These provide minimum requirements for success/failure of management actions and triggers for corrective actions. The approval holder will engage qualified and experienced consultants and specialists periodically throughout the offset delivery to ensure the offset outcomes are achieved. Section 491 of the EPBC Act makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the <i>Environment Protection and Biodiversity Conservation Regulations 2000</i> (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. As such, engaged consultants and specialists are required to complete a declaration of accuracy in reports provided to the Department, acknowledging their responsibility and accountability for information provided to the Department. Annual Compliance Reports must be published on the approval holder's website in accordance with an EPBC Act approval and will be subject to audit by the Department by an independent auditor in accordance with section 458 of the EPBC Act, and/or used to verify compliance with the conditions. Summaries of the result of an audit are typically published on the Department's website or through the general media. Governance arrangements include legal securement, monitoring responsibilities, reporting, and enforcement under the EPBC Act.
Have transparent governance arrangements including being able to be readily measures, monitored, audited and enforced	



5.3.1 Recovery plans and advice

5.3.1.1 Koala Conservation Advice and National Recovery Plan

Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory (Threatened Species Scientific Committee, 2010).

The Conservation Advice came into effect on 12 February 2022. It lists six conservation and recovery actions that are categorised into 'supporting strategies' which provide governance to coordinate actions, led by the Australian Government in partnership with the States and Territories, and 'on-ground (direct) strategies' which relate to improving habitat quality and restoration, implemented at the site level.

The impact and offset are considered to be consistent with the on-ground strategies detailed in the Conservation Advice and recovery Plan:

- Strategy 3: Increase habitat protection
- Strategy 5: Strategic habitat restoration
- Strategy 6: Active metapopulation management

Strategy 3: Increase habitat protection

Land-use change is the most significant threat to the Koala through habitat loss, fragmentation, and degradation. Increasing the total area of protected, connected, quality Koala habitat is important to protect and recover Koala populations.

The proposed offset area will create a net gain of Koala habitat, with improved habitat quality, connectivity, and longevity over the impact area. The eventual dedication of the offset site will protect this gain in Koala habitat in perpetuity, securing it from the threat of land-use change or increases in the intensity of current grazing practices.

Strategy 5: Strategic habitat restoration

Restoration increases the overall habitat available for Koalas and increases the connectivity between areas of habitat to contribute to ensuring the long-term survival of Koala populations. It involves restoring lost and degraded habitat to improve environmental functions.

While the project proposes to impact 19.1 ha of Koala habitat, the habitat within the impact area consists of a mixture of moderate and low value habitat as a result of high levels of disturbance and poor value habitat. At approximately four times the size of the impact area and with greater contextual suitability that will be protected, the rehabilitation of the proposed offset area will provide a net gain of Koala habitat by strategic habitat restoration. As it is surrounded by other offset sites and adjacent to Biodiversity Corridors, this habitat is located well to maximise the projected benefit to Koala.

Strategy 6: Active metapopulation management



Metapopulation management concerns the movement of individuals and genes between populations. Consideration of metapopulation management is reflected in the design of the development, specifically the creation and rehabilitation of conservation areas to promote connectivity and Koala movement within the landscape, and through the removal of hazards to Koala.

Although the project will involve the removal of habitat critical to the survival of the Koala, all significant residual impacts are to be compensated through the provision of land-based offsets. Proposed offsets will be located amongst Koala-occupied areas of connected and resilient habitat, and within the same sub-bioregion as the impact area.

South East Queensland Koala Conservation Strategy

The South East Queensland Koala Conservation Strategy 2020-2025 (the Strategy) (DES 2020) came into effect on 16 February 2020 and addresses the key threats facing Koalas and outlines strategies to stop the decline of Koala numbers and set in train the species' recovery. Issues addressed in the Strategy include:

Habitat protection

The project will involve the removal of habitat critical to the survival of koala as defined under the EPBC Act and Koala habitat area mapped under the Strategy.

All vegetation clearing under the project will continue to be governed by impact and pre-clearing management protocols including preparation of a site-based management plans and pre-start checklists.

Habitat restoration for Koalas

This impact area is located within an increasingly urbanised environment zoned as Urban Living under within the Ripley Vale Priority Development Area. Proposed offsets will be located in areas of connected and resilient habitat, where significant uplift in habitat quality is possible given the predominately non-remnant, cleared condition currently present due to extensive historical rural land uses.

Threat management

Section 5.2.6 lists the relevant threats to Koala (vehicle strike, dog attack and weed invasion) and effective mitigation measures to reduce risks during the construction and operational phases of the project. Mitigation measures are to be incorporated into Vegetation Conservation and Management Plans, and Fauna Management Plans. All contractors and visitors are to undertake site inductions to address threats and risks to MNES.

Improved mapping, monitoring, research and reporting

Not applicable.

Strong community engagement and partnerships

Awareness signage and traffic calming devices will be employed to ensure motorists are aware that koalas have potential to occur in the area, making them more conscious of potentially dispersing koalas and



encouraging them to maintain a low vehicle speed. The proponent will continue to be involved in perpetuity the proposed development, providing ongoing management of the action.

Partnerships and strategic coordination

Not Applicable.

The proposed action has sought to reduce impacts to the Koala through the avoid, mitigate and offset hierarchy. The proposed action has been sited within the referral area to reduce impacts to higher quality habitat within the state mapped Koala Habitat Areas as well as maintaining and enhancing connected habitat to the north and west. As such, only areas that are relatively fragmented and with low habitat scores and with lesser koala habitat value are proposed for removal and development. All vegetation clearing under the proposal will be government by State requirements for fauna management and any significant residual impacts are to be compensated through land-based offsets.

5.3.1.2 Grey-headed Flying-fox National Recovery Plan

The purpose of the National Recovery Plan for the Grey-headed Flying-fox is to set out the management and research actions necessary to stop the decline of and support the recovery of the Grey-headed Flying-fox over the next 10 years. The overall objectives of this Grey-headed Flying-fox recovery plan are: to improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed Flying-foxes through habitat identification, protection, restoration and monitoring, and to assist communities and Grey-headed Flying-foxes to coexist through better education, stakeholder engagement, research, policy and continued support to fruit growers.

The plan addresses the key threats facing the Grey-headed Flying-fox and recovery objectives which are provided below with responses relevant to the proposed action:

Identify, protect and increase native foraging habitat that is critical to the survival of the Grey-headed Flying-fox.

Although no roosts were identified on-site, the Grey-headed Flying-fox was recorded foraging within the referral area and as a fly-over. Habitat critical to the survival of the species is considered important winter and spring flowering vegetation communities. Important winter and spring vegetation communities are those that contain *Eucalyptus tereticornis*, *E. albens*, *E. crebra*, *E. fibrosa*, *E. melliodora*, *E. paniculata*, *E. pilularis*, *E. robusta*, *E. seeana*, *E. sideroxylon*, *E. siderophloia*, *Banksia integrifolia*, *Castanospermum australe*, *Corymbia citriodora*, *C. eximia*, *C. maculata*, *Grevillea robusta*, *Melaleuca quinquenervia* or *Syncarpia glomulifera* (Eby and Law 2008; Eby 2016; Eby et al. 2019).

Of the species listed above, *Corymbia Citriodora*, *Eucalyptus crebra* and *Eucalyptus tereticornis* were recorded within the impact area. The Grey-headed Flying-fox is a highly mobile species and the closest known active Grey-headed Flying-fox camp (as of 2024) is located approximately 5 km north-west of the site.

Reviewing the above, the referral area vegetation is considered to provide foraging habitat for this species. As such, the proposed action will result in the loss of 19.1 ha of potential foraging habitat for the Grey-



headed Flying-fox to facilitate the development and is considered unavoidable. The entirety of the impact area will be cleared to deliver educational facilities, however a linear Open Space and Ecological Corridor Zone adjacent to the eastern extent of the footprint will be retained, ensuring vegetation in the area will remain accessible for highly mobile species including the Grey-headed Flying-fox.

Identify, protect and increase roosting habitat of Grey-headed Flying-fox camps.

No roosts were identified within the comprehensive surveys of the impact area between 2022, 2024 and 2025, however, three (3) level 3 camps are located within 20 km of the impact area. This species was not observed as a fly over species nor foraging within the impact area. Given the site's proximity to several significant roosting sites, the action is only considered to impact on limited potential foraging habitat for the Grey-headed Flying-fox. Although the proponent does not consider the action to have a significant impact on the Grey-headed Flying-fox, the proposed offset will adequately compensate any potential loss.

Determine trends in the Grey-headed Flying-fox population so as to monitor the species' national distribution, habitat use and conservation status.

Not applicable. Mitigation measures will be implemented during construction and operation of the proposed action to reduce threats.

Build community capacity to coexist with flying-foxes and minimise the impacts on urban settlements from new and existing camps while avoiding interventions to move on or relocate entire camps.

There are no observed roosts on-site, with the nearest known roost site located approximately 5 km north-west of the site.

Increase public awareness and understanding of Grey-headed Flying-foxes and the recovery program and involve the community in the recovery program where appropriate.

Mitigation measures, including wildlife awareness signage, speed limits and vehicle slow points, to increase awareness for this species within the community.

Improve the management of Grey-headed Flying-fox camps in areas where interaction with humans is likely.

Not Applicable. There are no observed roosts on-site, with the nearest known active roost site located approximately 5 km north-east of the site.

Significantly reduce levels of licenced harm to Grey-headed Flying-foxes associated with commercial horticulture.

Not applicable.

Support research activities that will improve the conservation status and management of Grey-headed Flying-foxes.

Not applicable.

Reduce the impact on Grey-headed Flying-foxes of electrocution on power lines, and entanglement in netting and on barbed-wire.



This species was not identified foraging within the impact area nor as a fly-over species during field surveys. No roosts were identified on-site, and the nearest known roost site located approximately 5 km north-west impact area. As such, it is considered that the referral area vegetation provides potential foraging habitat for this species.

The proposed action will involve the removal of 19.1 ha of potential foraging habitat within the impact area. The entirety of the impact area will be cleared to deliver educational facilities, however a linear Open Space and Ecological Corridor Zone adjacent to the eastern extent of the footprint will be retained, ensuring vegetation in the area will remain accessible for highly mobile species including the Grey-headed Flying-fox. Electrocution on powerlines where they occur is a risk, however, entanglement in netting and on barbed-wire fencing is considered highly unlikely and can be managed through the implementation of mitigation measures and procedures outlined within future management documents including the VC&MP and FMP. As such, the proposed action is not considered likely to impact the recovery of this species.



6. Baseline Surveys

6.1. Offset Area Baseline Surveys – Methodology

Baseline field surveys to determine habitat quality for Koala and GHFF, non-native vertebrate pest presence and weed mapping was completed on 21st, 26th, 27th, 28th August, 9th September and 7th October 2025. Refer **Table 29** and the subsections below for specific details on survey dates for each method applied.

Table 29: Offset area baseline field surveys methods summary

Date	Temperature	Rainfall	Methods implemented
21 st August 2025	11.0°C min – 21.0°C max	2 mm	Motion sensor camera installation Quaternary assessments
26 th August 2025	8.2°C min – 25.0°C max	0 mm	MHQA transects SAT & GHFF surveys Nocturnal surveys
27 th August 2025	7.6°C min – 29.4°C max	0 mm	MHQA transects SAT & GHFF surveys
28 th August 2025	13.6°C min – 24.7°C max	0 mm	MHQA transects SAT & GHFF surveys
9 th September 2025	8.0°C min – 28.5°C max	0 mm	Motion Sensor Camera collection Quaternary assessments
7 th October 2025	11.1°C min – 35.6°C max	0 mm	Weed mapping and transects

NB: Temperature data sourced from Bureau of Meteorology (BoM) – Station 040082 University of Queensland Gatton.

6.1.1 Habitat - MNES

The MNES habitat quality assessment methods used for the impact area were also applied to the proposed offset area. Site condition within the proposed offset area was assessed using the BioCondition method as per the Queensland environmental offsets framework within three (3) AU's identified in the proposed offset area as shown in **Table 30** and shown in **Plan 11**. Site condition was measured through the completion of MHQA transects. Assessment at multiple locations per assessment unit is necessary where possible to measure vegetation condition at representative locations across the spatial extent of each assessment unit. Field survey effort is provided as **Plan 12**.

For the purposes of this assessment, all AUs currently provide for Koala habitat ranging from dispersal (AU1) to foraging and breeding (AU2 and AU3) and both AU2 and AU3 currently provide foraging habitat for the GHFF (**Plan 11**).

Site condition was assessed through the completion of a total of six (6) MHQA transects within the proposed offset area to account for minor variations in conditions.



Table 30: Summary of assessment units and MHQA transects – offset area

Assessment unit	Vegetation community	VMA Category	Vegetation Type	Offset Area (ha)	MHQA transect
AU1	RE12.12.5 (non-remnant)	Category X	Open Paddock	36.3	Transects 1 and 2
AU2	RE12.12.5 (non-remnant)	Category X	Regrowth	50.5	Transects 3 and 6
AU3	RE12.12.5 (remnant)	Category B	Remnant	14.0	Transects 4 and 5

These Regional Ecosystems are known to support both Koala and GHFF both in terms of foraging habitat and suitable areas for breeding. As detailed in following sections, the proposed offset site supports the ability for these Regional Ecosystems to be substantially improved via securing and protecting the offset site, suppression and control of pests and habitat rehabilitation and regeneration. In summary, the Assessment Units are relatively disturbed, ranging from open paddocks that are devoid of canopy vegetation to relatively isolated remnant patches that require rehabilitation, and the regeneration of habitat value across the offset site will facilitate ongoing habitat and connectivity value to the target MNES.

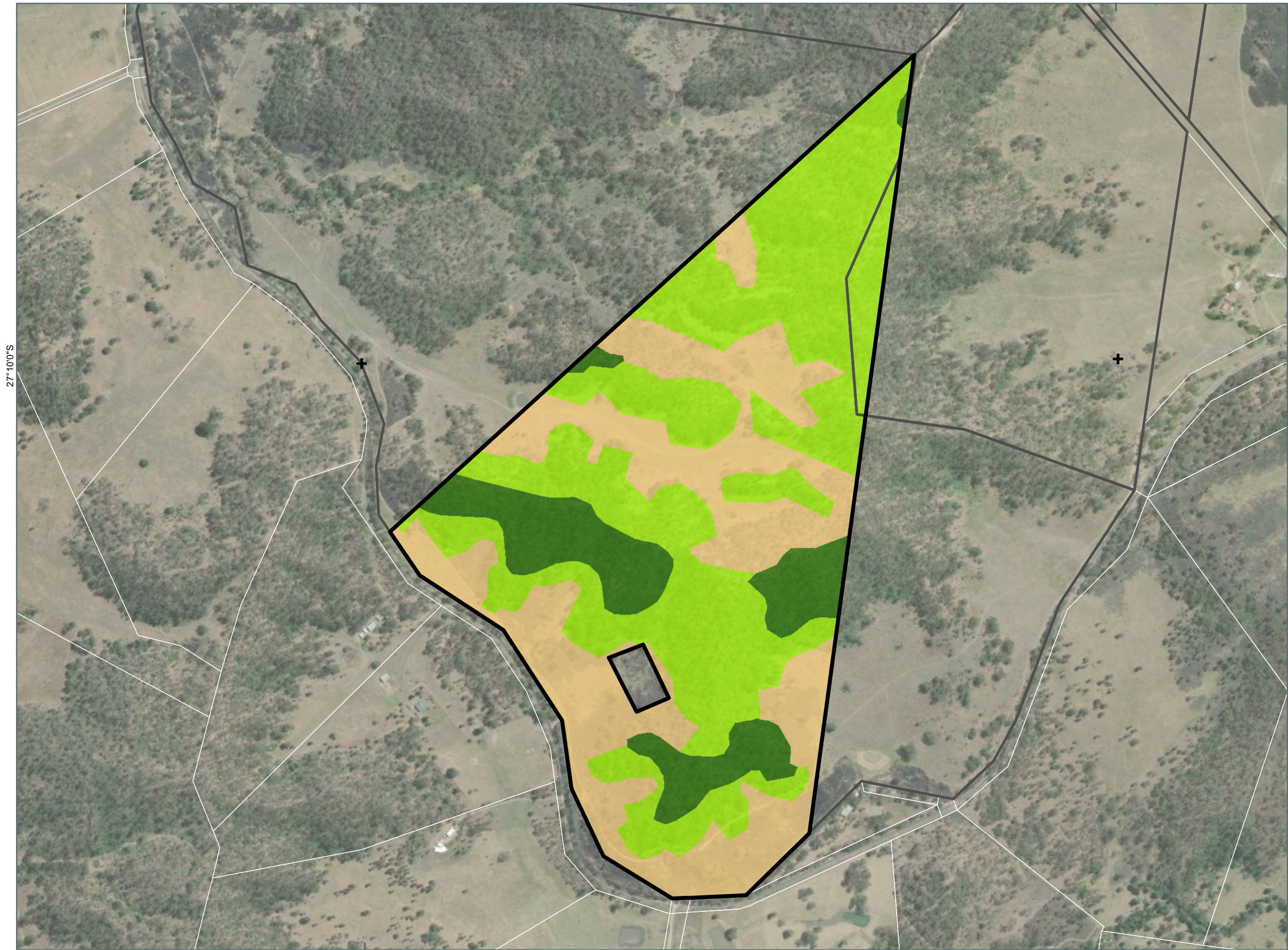
6.1.2 Koala – Modified Habitat Quality Assessment (MHQA)

The Koala MHQA methodology applied at the offset site is as per that applied at the impact site (refer **Section 3.3.1**).

Results of the context assessment are shown on **Plan 13** and **Plan 14**. The Offset Area Biodiversity Corridors are presented on **Plan 9**.



11. OFFSET AREA ASSESSMENT UNITS



Notes:
The information on this plan is not suitable for any purpose other than the expressed use of the Client. Property dimensions, areas, numbers of lots and contours and other physical features may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of Saunders Havill. Unless a development approval states otherwise, this is not an approved plan.

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LEGEND

□ Qld DCDB

▭ Offset Property

▭ Offset Area

Assessment Units

Assessment Unit 1:

Category X - Open paddock
[36.3 ha]

Assessment Unit 2:

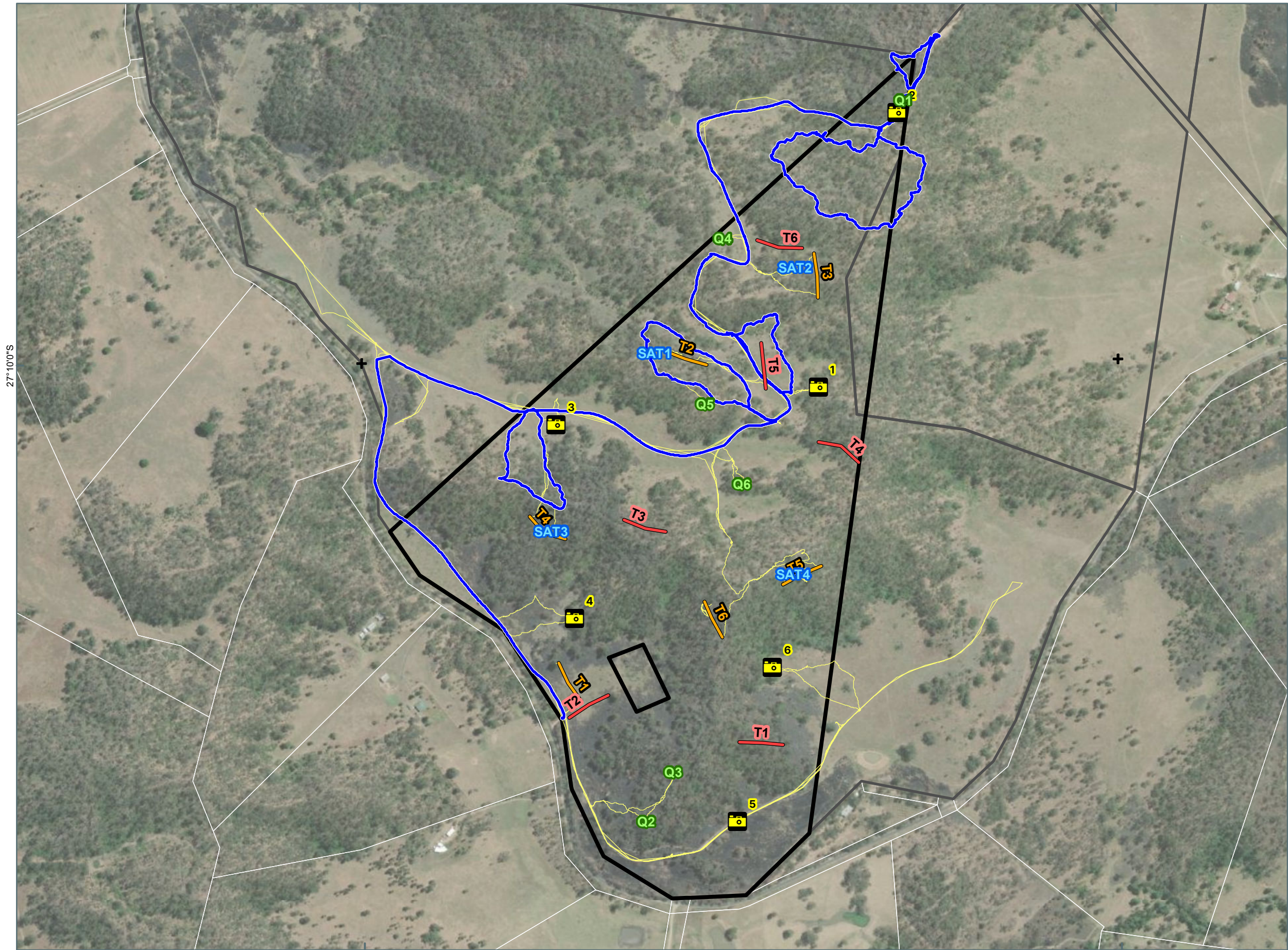
Category X - Regrowth vegetation
[50.5 ha]

Assessment Unit 3:

Remnant vegetation
[14.0 ha]



12. OFFSET AREA BASELINE FIELD SURVEY EFFORT

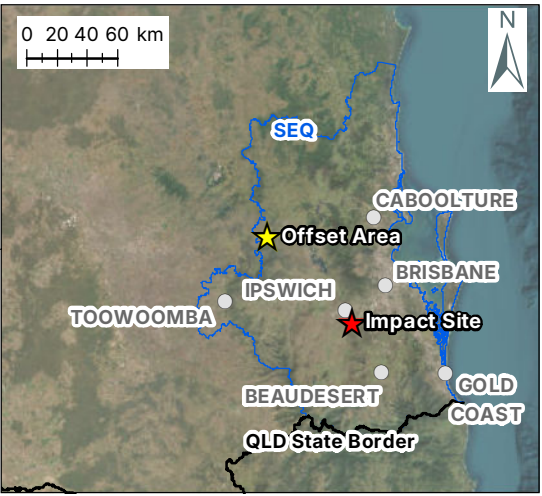


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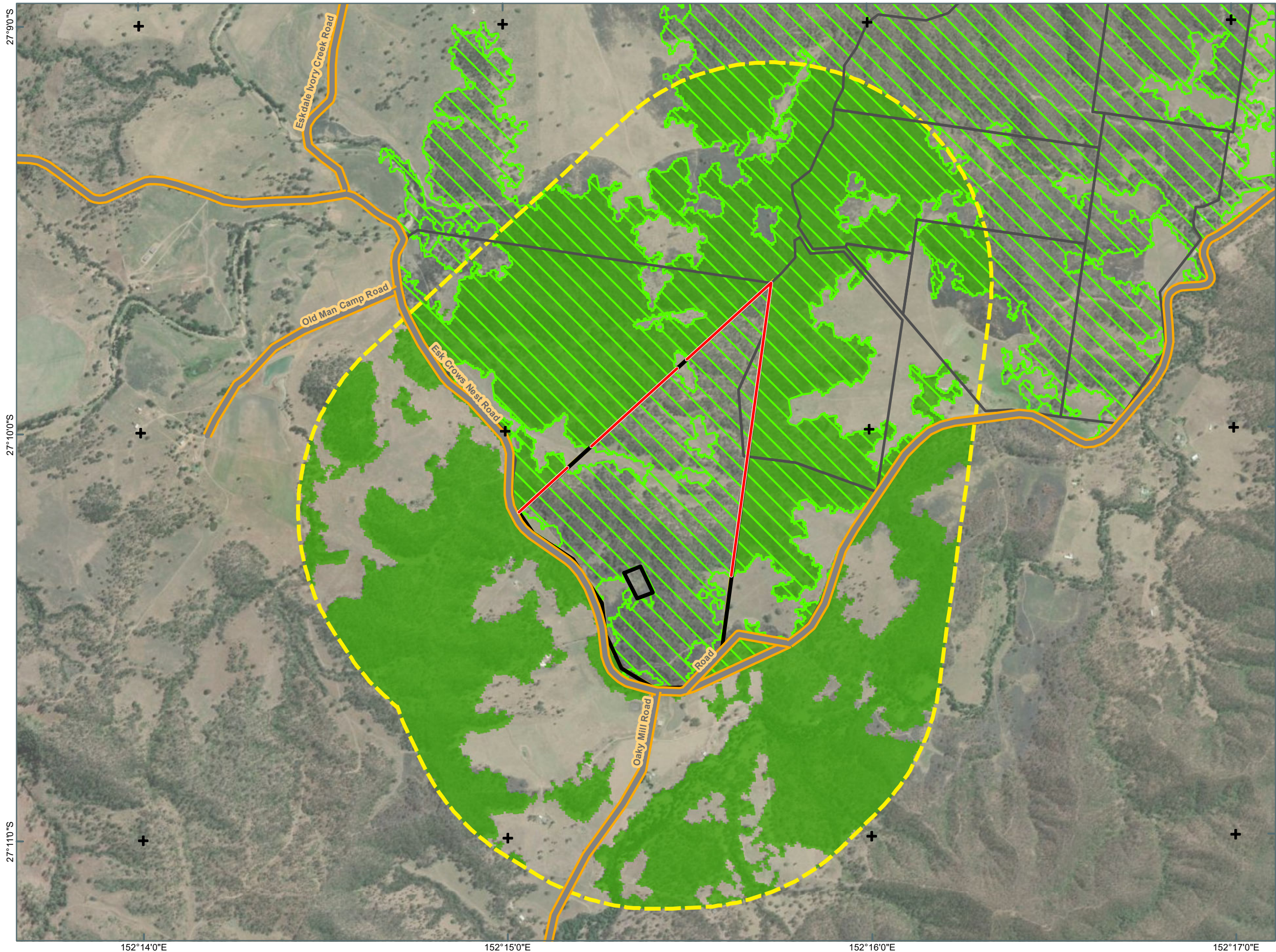
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LEGEND

- Qld DCDB
- Offset Property
- Offset Area
- MHQA Transects
- SAT Survey Locations
- Spotlighting Survey
- Quaternary Survey Locations
- Camera Trap Locations
- Weed Transect (Baseline)
- Observational surveys



13. OFFSET AREA KOALA CONTEXT ASSESSMENT



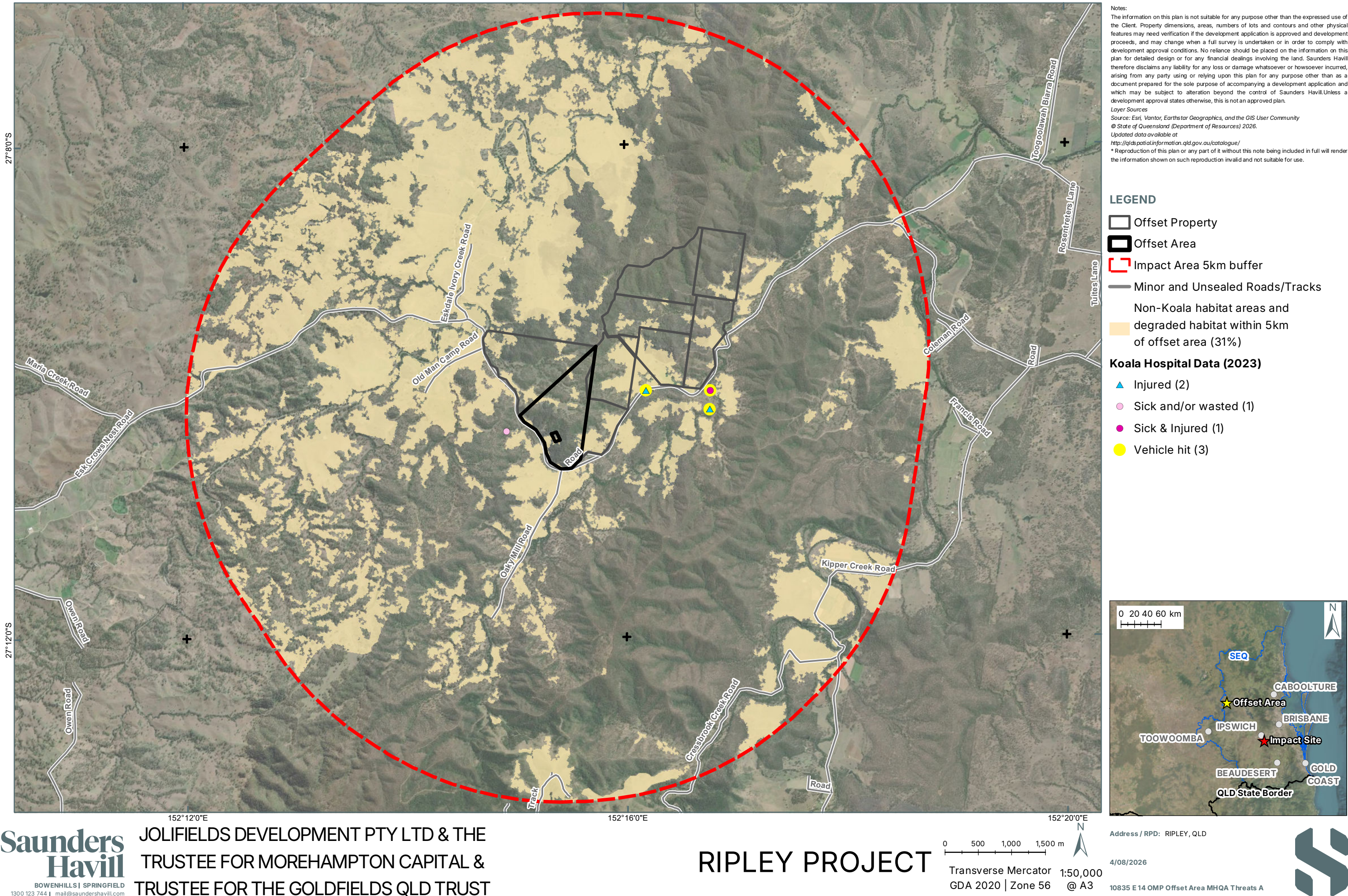
Notes:
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- LEGEND**
- Offset Property
 - Offset Area
 - Major & Arterial Roads
 - Percentage of offset area boundary supporting a Koala critical habitat connection off and on site - 57.4%
 - 1km Offset Area buffer
 - Percentage of Koala critical habitat within 1km of offset area (65.5%)
 - Size of Koala critical habitat patch adjoining offset area > 5000 ha



14. OFFSET AREA MHQA KOALA THREATS ASSESSMENT



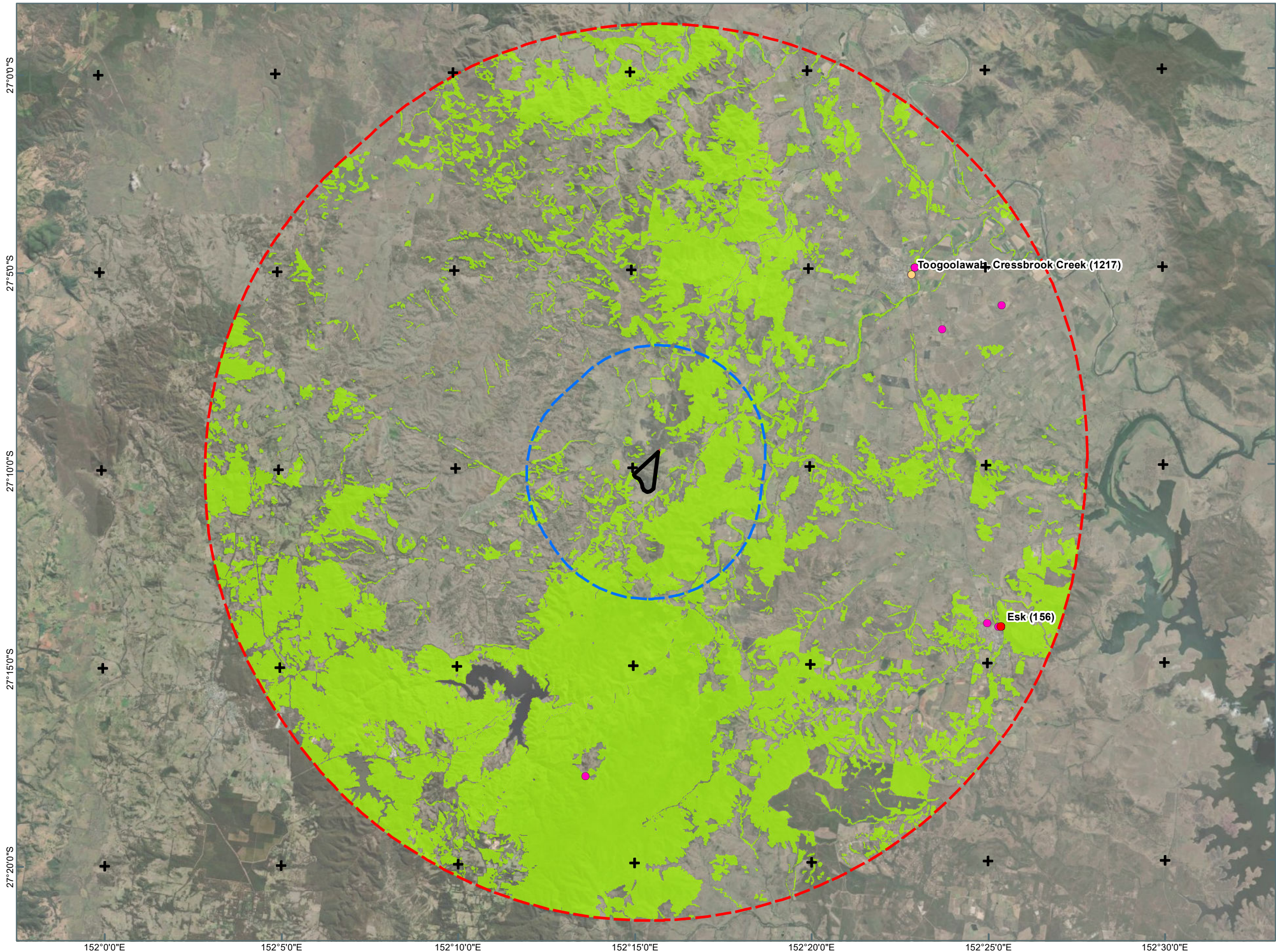
6.1.3 Grey-headed Flying-fox – Foraging Assessment Tool

The Grey-headed Flying-fox FHA methodology applied at the offset site is as per that applied at the impact site (refer **Section 3.3.3**).

The results of the GHFF FHA Context Assessment are presented on **Plan 15**.



15. OFFSET AREA GHFF CONTEXT ASSESSMENT



Notes:
The information on this plan is not suitable for any purpose other than the expressed use of the Client. Property dimensions, areas, numbers of lots and contours and other physical features may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of Saunders Havill. Unless a development approval states otherwise, this is not an approved plan.

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LEGEND

- Qld DCDB
- Offset Area
- 5km Offset Area buffer
- 20km Offset Area buffer
- Potential and known Grey-headed Flying-fox foraging habitat within 20km of offset area - 37%
- Grey-headed Flying-fox records within 20km of offset area recorded within past 20 years [42]

GHFF Roosts (Fed. Gov., 2024)

- Grey-headed Flying Fox roost inactive within recent surveys [0]
- Grey-headed Flying Fox roost active within recent surveys [1]
- Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [1]
- Nationally significant Grey-headed Flying Fox roost active within recent surveys [0]
- Nationally significant Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [0]



6.1.4 Spot Assessment Technique surveys

Baseline Koala activity levels were determined through utilising the SAT surveys (Phillips et al. 2011). The SAT method is an industry recognised technique for identifying presence/absence of Koala at a site. Results from the SAT surveys are compared against current available published scientific literature to identify an estimated Koala carrying capacity (stocking rate) to be determined. A total of four (4) SAT surveys were completed across the proposed offset area in conjunction with MHQA transects 2, 3, 4, 5, 6, (refer **Plan 12**) to target presence of Koala.

6.1.5 Motion-triggered camera trapping

Surveys for non-native vertebrate pest presence, primarily targeting wild dogs which are the primary threat to Koala, were completed via the use of infrared motion-triggered camera trapping. Camera trapping involves setting up a fixed digital camera to capture images or video of animals that pass in front of a camera with an infrared trigger. This survey technique identifies fauna activity beyond the scope of direct observational studies and with the absence of potential observer impacts. The method for determining camera locations utilised the standard grid-based system which is common practice on sites where access is good. In lieu of any published guidelines from DCCEEW for monitoring wild dogs, the amount of cameras/distance between cameras was driven by several case studies and existing guidelines. These documents state a distance of between 500m and 1000m between camera locations, given the vast home range and mobility of wild dogs. For this assessment the lower threshold of 500m was utilised to improve the chance of wild dog detection within the proposed offset area.

Once the camera locations were determined, cameras were directed to animal trails which are more likely to support fauna. Heavy, loose vegetation was avoided to reduce the chance of false triggering, and the camera was aimed to avoid sun shining directly onto the lens. Cameras were attached 30-100 cm from the ground on a tree or post and directed towards landscape features.

Six (6) camera traps were installed across the proposed offset area for a period of 19 nights from 21st August 2025 to 9th September 2025, baited with chicken necks to target wild dogs and other known potential threats to MNES in the broader area. Refer to **Table 31** for a description of camera deployment locations.



Table 31: Fauna camera summary (21st August to 9th September 2025)

ID	Latitude	Longitude	Photo	Description
1	-27.16174	152.26186		Camera 1 was deployed in the northern portion of the offset area, along a dirt access track.
2	-27.16699	152.25987		Camera 2 was deployed within the north-eastern portion of the offset area along a ridgeline.
3	-27.16803	152.25425		Camera 3 was deployed within the eastern portion of the offset area along the central gully area close to a what appeared to be a permanent water source.

ID	Latitude	Longitude	Photo	Description
4	-27.17173	152.25471	 A photograph showing a camera mounted on a tree trunk in a grassy, open area with scattered trees in the background.	Camera 4 was deployed within the southern corner of the offset area adjacent to the main road.
5	-27.17283	152.25908	 A photograph showing a camera mounted on a tree trunk within a dense, brushy area.	Camera 5 was deployed along the south-western boundary of the offset area within a patch of vegetation.
6	-27.17566	152.25816	 A photograph showing a camera mounted on a tree trunk in a grassy area with trees and a path visible.	Camera 6 was deployed within the south-eastern corner of the offset area. This camera was angled to also view the main access track.

6.1.6 Relative Abundance Index

The results of the motion-triggered camera detection survey (recorded species and number of occurrences over days of camera deployment) were utilised to provide relative abundance of non-native vertebrate pest species over the proposed offset area, reducing bias and increasing repeatability.

A relative abundance index (RAI) is then calculated for feral animal abundance, using the formula **RAI = D/TN x 100**, where D is number of individual detections and TN is the total number of camera-trap nights (all cameras combined). This methodology ensures that the surveys are representative of the entire area and are repeatable for future monitoring requirements. A higher RAI indicates a higher pest presence.

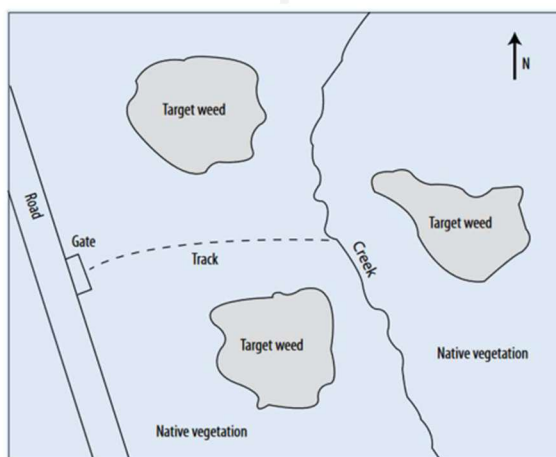


6.1.7 Weed mapping

Weeds and WONS are considered the primary focus of this assessment. Mapping non-native flora is ideally done by directly delineating every plant to provide an exact percentage coverage for the site. However, this method is often not feasible given the abundance of weeds and the mixture of flora species across the site. Therefore, the percentage cover of weeds was determined using a two-step method detailed in the *Guidelines for Monitoring Weed Control and recovery of native vegetation* (Auld 2009).

Step 1: Delineate weed patches

Using an antenna-based GPS system, the spatial extent or patches of weeds (including WONS) within the proposed offset area was mapped on-ground as polygons to produce a 'mud map' of the site (refer **Extract 1**). Each polygon was given an initial visual estimate of weed cover percentage. This step is completed to define patches of weeds and subsequently guide the placement of targeted weed transects as a means of accurately estimating percentage cover within a given patch. The entirety of the proposed offset area was observed to contain consistent weed coverage in the form on non-native pasture grasses throughout.



Extract 1: 'Mud map' from Auld (2009) – Figure 1.

Step 2: Line-transect method

To quantify the percentage cover within each mapped area the line-transect methodology presented in the *Guidelines for Monitoring Weed Control and recovery of native vegetation* (Auld 2009) was implemented.

In this methodology, the ground cover of a weed is a measure of the perpendicular projection of aerial parts of plants to the ground. This method minimises user variability as cover calculations are not reliant on estimations, as cover is instead accurately measured against the tape, typically standardised at 100 metres in length. With this technique, the percentage cover of all weed species (WONS and non-WONS) along the line transect is recorded.

The entirety of the proposed offset area was observed as consistent vegetation communities and ground covers as a result of widespread cattle grazing. Six (6) 100 m transects were established across the proposed offset area to obtain quantifiable data. Auld (2009) does not prescribe a minimum number of line-transects, a feature of other transect methods such as the BioCondition Assessment Manual. Due to the relatively small size of the proposed offset area and consistent conditions, the location of transects



are considered adequate to represent the general condition of the proposed offset area. Weed intensity was mapped as Low (<25% cover), Moderate (>25% and <50% cover) and High (>50% cover).

Surveys to estimate the weed cover using the vegetation cover classes proposed by Auld (2009) will be undertaken by suitably qualified persons before the end of Years 5, 10, 15, and 20 of the offset and in addition to Modified Habitat Quality Assessment transects which also involve a component of weed cover estimation. Due to the location and size of weed patches during baseline surveys, two weed transects were conducted for each patch category (low, medium and high), but if additional transects are required as part of future surveys, the average cover percentage for a patch will be calculated. Results and progress against the management and monitoring actions will be reported on as part of the Annual Compliance Report.

6.2. Offset Area Baseline Assessment Results

6.2.1 Assessment unit descriptions

Assessment Unit 1

The mapped Category X (non-remnant) areas which displayed high levels of disturbance and were reflective of open paddock areas have been categorised as Assessment Unit 1 (AU1). AU1 has been categorised as non-remnant vegetation of pre-clear RE12.12.5. The majority of AU1 consists of cleared paddocks dominated by pasture grasses. Ground cover species present are predominantly native species including *Heteropogon contortus* (Black Spear Grass), *Panicum decompositum* (Native Millet), *Cynodon dactylon* (Couch Grass), *Aristida stricta* (Threeawned Wiregrass), *Lomandra multiflora* (Many Flowered Mat Rush), *Glycine clandestine* (Twining Glycine), *Cyperus gracilis* (Slender Flatsedge) and *Chrysocephalum apiculatum* (Yellow Buttons). Exotic weed species include *Lantana camara* (Lantana), *Centella asiatica* (Pennywort), *Gomphocarpus physocarpus* (Balloon Cotton Bush), *Oxalis stricta* (Common Yellow Woodsorrel), *Sporobolus africanus* (Parramatta Grass) and *Cirsium vulgare* (Spear Thistle). Where trees are present these are reflective of pre-clear RE12.12.5 including *Corymbia citriodora* (Spotted Gum) and *Corymbia intermedia* (Pink Bloodwood). **Photo set 1** displays vegetation present within AU1.



Photo set 1: Cleared paddock vegetation present within Category X areas, categorised as AU1.

Assessment Unit 2

The mapped Category X (non-remnant) areas which displayed high levels of disturbance and consisted of eucalypt regrowth have been categorised as Assessment Unit 2 (AU2). AU2 has been categorised as non-remnant vegetation of pre-clear RE12.12.5. The majority of AU2 consists of scattered regrowth canopy species as well as dense understory vegetation. Ground cover species present are predominantly native species including *Heteropogon contortus* (Black Spear Grass), *Imperata cylindrica* (Blady Grass), *Aristida calycina* (Dark Wiregrass), *Dianella caerulea* (Blue Flax-lily), *Chrysocephalum apiculatum* (Yellow Buttons), *Lomandra multiflora* (Many Flowered Mat Rush) and *Glycine clandestine* (Twining Glycine). Exotic weed species include *Melinis repens* (Red Natal Grass), *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Sporobolus africanus* (Paramatta Grass) and *Tecoma stans* (Yellow Bells). Where trees are present these are reflective of pre-clear RE12.12.5 including *Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Corymbia intermedia* (Pink Bloodwood) and *Corymbia tessellaris* (Moreton Bay Ash). **Photo set 2** displays vegetation present within AU2.



Photo set 2: Regrowth vegetation present within Category X areas, categorised as AU2.

Assessment Unit 3

The mapped Category B (remnant) areas within the proposed offset area consisted of eucalypt vegetation which has been categorised as Assessment Unit 3 (AU3). AU3 has been categorised as mapped remnant vegetation of Least Concern RE 12.12.5. AU3 consists of a moderately dense canopy layer of *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow Leaf Ironbark), confirming the presence of mapped RE12.12.5. The shrub layer was dominated by *Acacia melanoxylon* (Australian Blackwood), *Xanthorrhoea johnsonii* (Johnson's Grass Tree) and *Alphitonia excelsa* (Soap Tree), with the presence of regrowth juvenile eucalypt species identified. Ground cover species present were predominately native grasses including, *Heteropogon contortus* (Black Spear Grass), *Imperata cylindrica* (Blady Grass), *Eragrostis brownii* (Brown's Love Grass), *Themeda triandra* (Kangaroo Grass) and *Aristida calycina* (Dark Wiregrass). Exotic weed species include *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), *Senecio madagascariensis* (Fireweed), *Melinis repens* (Red Natal Grass) and *Gomphocarpus physocarpus* (Balloon Cotton Bush). **Photo set 3** displays vegetation present within AU3.





Photo set 3: Remnant vegetation present within mapped Category B areas, categorised as AU3.

6.2.2 Koala Discussion

Site condition (30%)

The site condition scoring for the proposed offset area is summarised in **Table 32**. Refer to **Appendix B** for detailed baseline Koala MHQA scoring.

Table 32: Site condition scores for offset area assessment units

Parameter	AU1	AU2	AU3
Pre-clear Regional Ecosystem	12.12.5	12.12.5	12.12.5
Remnant/Non-remnant/Regrowth	Non-remnant	Non-remnant	Remnant
Vegetation Type	Open Paddock	Regrowth	Remnant
Recruitment of woody perennial species in EDL	5	5	5
Native plant species richness - trees	2.5	2.5	2.5
Native plant species richness - shrubs	2.5	2.5	2.5
Native plant species richness - grasses	0	0	2.5
Native plant species richness - forbs	0	2.5	2.5
Average tree canopy height*	4	5	5
Average tree canopy cover*	3.5	4	4
Shrub canopy cover	5	3	3
Native grass cover	5	5	5
Organic litter	3	3	3



Parameter	AU1	AU2	AU3
Large trees	5	5	5
Coarse woody debris	2	0	2
Non-native plant cover	0	3	0
Quality and availability of food and foraging habitat	20	20	20
Quality and availability of shelter	4	20	20
Total (Out of 100)	61.5	80.5	82.0
Score out of 3	1.15	1.51	1.54

Quality and availability of food and foraging habitat

The Koala habitat index attributes are based on the prescribed methodology. The attributes for all AUs scored **20** out of **40** for 'quality and availability of food and foraging habitat' (refer **Table 34**).

Quality and availability of shelter

The Koala habitat index attributes are based on the prescribed methodology. The attributes for AU1 scored **4** and AU2 and AU3 **20** out of **40** for 'quality and availability of shelter habitat' (refer **Table 35**).

Site Context (30%)

The site context characteristics for Koala are shown on **Plan 9** with scores summarised in **Table 33**.

Table 33: Koala site context scores for offset area

Parameter	AU1 (non-remnant pre-clear RE12.12.5)	AU2 (non-remnant pre-clear RE12.12.5)	AU3 (remnant RE12.12.5)
Size of patch	0	10	10
Connectedness	4	4	4
Context	4	4	4
Ecological corridors	6	6	6
Role of the site location to species overall population in the state	5	5	5
Threats to species	7	7	7
Species mobility capacity	7	7	7
Total (out of 56)	33	43	43



Parameter	AU1 (non-remnant pre-clear RE12.12.5)	AU2 (non-remnant pre-clear RE12.12.5)	AU3 (remnant RE12.12.5)
Score out of 3	1.77	2.30	2.30

Size of patch

The proposed offset area is connected to a patch of >5000 ha therefore achieves a score of **10** out of **10** (refer **Plan 13**).

Connectedness

The proposed offset area shares 57.4% of its boundary with Koala habitat therefore achieves a score of **4** out of **5** (refer **Plan 13**).

Context

Retained critical Koala habitat within a 1 km buffer of the proposed offset area was calculated at 65.5% and therefore achieves a score of **4** out of **5** (refer **Plan 13**).

Ecological corridors

The proposed offset area is located adjacent to a Statewide corridor of regional significance, as well as within a SEQ Regional Plan – Regional Biodiversity Corridor (refer **Plan 9**) therefore achieves a score of **6** out of **6**.

Role of site

The offset area is a suitable offset so scores **5** out of **5**.

Threats to species

Threats to Koala were detected across the broader Willowvale Offset Property including wild dog and red fox presence, degradation of habitat through uncontrolled weed infestations (namely *Lantana camara* (Lantana)), uncontrolled wildfire, and the presence of barbed wire fencing. Additional to this is the indirect threat of revegetation destruction by non-native herbivores.

A major threat to Koala is the presence of wild dogs which were recorded within the proposed offset area as (RAI 2.63) and are known to occur across the broader Offset Property. Additionally, the Queensland WildNet database has identified two (2) confirmed records of *Canis* sp. and/or *Canis familiaris* (wild Dog) and two (2) sightings of *Vulpes vulpes* (European red fox) within 20 km of the proposed offset area. Wild dogs are known to travel up to 20 km seeking prey with home ranges of individuals likely to overlap with the proposed offset area.

Under the prescribed methodology, the offset site scored **7** out of **15** for threats (refer **Table 36**).



An adaptive management approach is proposed to manage threats from dogs and other vertebrate pest species for the life of the offset (20 years).

Species mobility capacity

Species mobility capacity scored 7 out of 10 as per the prescribed methodology (refer **Table 37**).

Table 34: Offset Site Foraging Habitat Assessment

AU	1		2		3	
Stems						
Transect	1	2	3	6	4	5
Stem Count	5	47	80	44	49	68
Stems/ha	25	235	400	220	245	340
Mean S/ha	130		310		292.5	
Benchmark	680		680		680	
%Benchmark	19.12		45.59		43.01	
Stem Score	2		4		4	
Cover						
%Benchmark	47.93		87.32		126.46	
Cover Score	1		2		2	
Foraging Total	3		6		6	
Foraging Score	20		20		20	

Table 35: Offset Site Shelter Habitat Assessment

AU	1		2		3	
Stems						
Transect	1	2	5	6	9	10
Stem Count	5	47	80	44	49	68
Stems/ha	25	235	400	220	245	340
Mean S/ha	130		310		292.5	
Benchmark	680		680		680	
%Benchmark	19.12		45.59		43.01	
Stem Score	1.5		3		3	
Large Trees						
%Benchmark	10.34		17.24		20.69	
Large Tree Score	1		1		1	
Shelter Total	2.5		4		4	
Shelter Score	4		20		20	



Table 36: Offset Site Threats Assessment

Metric	Low	Moderate	High
Clearing and Degradation of Habitat	Apply one of the following options in order of priority: 1. Apply a current legal protective mechanism. 2. The site is zoned for conservation purposes or clearing is not permitted. 3. If $\leq 30\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: $>30\%$ and $<70\%$ of the area within a 5km buffer of the site is cleared or disturbed land.	Apply one of the following options in order of priority: 1. The site is zoned for development 2. If $\geq 70\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.
Score Weighting	6	2.8	0.4
Inappropriate Fire Regimes - Very High Risk	Current Government endorsed Bushfire Management Plan (BMP) including specific measures to protect the Koala is in effect.	Moderate potential bushfire risk identified by State or Local government within or adjacent to ($<100\text{m}$) the site. OR A site-specific BMP is in effect.	High or very high bushfire risk identified by State or Local government within or adjacent to ($<100\text{m}$) the site.
Score Weighting	6	2.8	0.4
Vehicle Strike - Moderate Risk	Located more than 1km from a major road AND Fauna safe design features in place between the site and any minor roads within 500m	Located $<500\text{m}$ from a major road with fauna safe design features) OR Located $<1\text{km}$ from a major road accessible for koalas (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m	Located $<500\text{m}$ from a major road (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m
Score Weighting	1.5	0.7	0.1



Metric	Low	Moderate	High
Dog Attack - Moderate Risk	No dogs recorded on or adjacent to the site OR A government endorsed pest management plan is in place with completion criteria targeting no dog recordings.	Dogs recorded on site and adequate refuge for Koalas (>70% canopy cover).	Dogs recorded on site and limited refuge for Koalas (<70% canopy cover)
Score Weighting	1.5	0.7	0.1
Threats to Species			
Threshold Analysis	≥10	>4 and <10	≤4
Score	15	7	1
Description	Low threat level (i.e. likely to survive)	Moderate threat level	High threat level (i.e. likely to result in death, irreversible damage)
Final Score	5.4		
Final Treat Level Score	7		

Table 37: Offset Site Mobility Assessment

Quadrant	Description	Rating	%
North	Cleared open paddock with gaps greater than 200 m	Moderate restriction	40
East	Cleared open paddock with gaps greater than 200 m	Moderate restriction	40
South	Cleared open paddock with gaps greater than 200 m	Moderate restriction	40
West	Mix of extant vegetation and open paddock	Minor restriction	0
Average			30
Score			Moderate restriction 7

Species stocking rate (40%)

Both evidence of (scats) and a direct sighting of Koala was recorded within the proposed offset area during field surveys. Five (5) SATs were completed at MHQA transects 2, 3, 4, 5 and 6 MHQA transect locations. Koala scat was recorded at survey locations 2, 3 and 4 (refer **Photo set 4**). A direct sighting of a Koala and joey was recorded within the offset area during nocturnal field surveys (refer **Photo set 5**).





Photo set 4: Koala scat identified via SAT surveys during offset area field assessment.



Photo set 5: Koala and joey sighted within the offset area during nocturnal field surveys.

A summary of the SAT survey results completed at each MHQA transect are provided in **Table 38**, with raw data provided at **Appendix D**.

Table 38: Baseline SAT survey results

SAT ID (MHQA transect)	Number of scats	Evidence of Koala activity (%)	Koala use (East Coast med-high)
AU1			
SAT 2 – Transect 2	4	13	Low
AU2			
SAT 3 – Transect 3	4	13	Low
SAT 6 – Transect 6	0	0	Nil
AU3			
SAT 4 – Transect 4	1	3	Low
SAT 5 – Transect 5	0	0	Nil

The SAT surveys demonstrate that koalas utilise most of the AUs across the site and that the offset area has the capacity to support ecological gain for the koala.

The species stocking rate for Koala scored **30** out of **70** for AU1 and **40** out of **70** for AU2 and AU3 (refer **Table 39**). Further details on the assessment are provided below:

- Indirect contemporary evidence of Koala evidence was recorded within the proposed offset area in the form of scats (refer **Photo set 4**). Direct contemporary evidence was also observed within the offset area during field surveys (refer **Photo set 5**). The species is known to be present within the local area and was observed utilising the site during recent nocturnal site surveys, 'presence detected on or adjacent to site' was assigned a score of **10** out of **10**.
- Areas of the site contained remnant and regrowth eucalypt vegetation as well as cleared open paddock. Due to the species being observed during recent field surveys and the presence of Koala foraging habitat, 'usage of the site (habitat type and evidence usage)' was assigned a score of **5** out of **15** for AU 1 Dispersal habitat and **15** out of **15** for AU2 and AU3 Foraging/Breeding habitat.
- The 'approximate density' was scored **10** out of **30** due to presence of the species observed during recent field surveys as well as scat evidence. It is considered that given the variability in the landscape of the greater offset area matrix at present Koala likely utilise the more heavily treed and connected habitat areas within the surrounding habitat for breeding. The capacity of the proposed offset area to support Koala will improve with active regeneration.
- Using the precautionary principle, the proposed offset area is considered a key source for population for dispersal under 'role/importance of species population on-site' therefore was scored a **5** out of **15**.

Table 39: Koala species stocking rate scores within offset area assessment units.

	AU1	AU2	AU3
Presence detected on or adjacent to site (neighbouring property)	10	10	10



	AU1	AU2	AU3
with connecting habitat) (/10)			
Species usage of the site (habitat type and evidenced usage) (/15)	5	15	15
Approximate density (per ha) (/30)	10	10	10
Role/importance of species population on site* (/15)	5	5	5
Total Species Stocking Rate Score (/70)	30	40	40
Species Stocking Rate Score – out of 4	1.77	2.29	2.29

***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**

	AU1	AU2	AU3
Key source population for breeding (/5)	0	0	0
Key source population for dispersal (/5)	5	5	5
Necessary for maintaining genetic diversity (/15)	0	0	0
Near the limit of the species range (/15)	0	0	0

6.2.3 Grey-headed Flying-Fox Discussion

Site Condition (40%)

The baseline site condition characteristics for grey-headed flying-fox are summarised below, results are available in **Appendix B**.

- AU1 – **1.30** out of **4**.
- AU2 – **1.46** out of **4**.
- AU3 – **1.81** out of **4**.

Site Context (30%)

The baseline site context characteristics for grey-headed flying-fox are shown on **Plan 15** with results summarised in **Appendix B**.

- AU1 – **1.75** out of **3**.
- AU2 – **1.75** out of **3**.
- AU3 – **1.75** out of **3**.



A 'moderate' level of threats to GHFF are present within the offset area including the presence of barbed wire.

Species Stocking Rate (30%)

The baseline species stocking rate scores is determined by the stem density of GHFF foraging species. The offset area species stocking rate results for grey-headed flying-fox are summarised in **Appendix B**.

- AU1 – **1.20** out of **3**.
- AU2 – **1.20** out of **3**.
- AU3 – **1.20** out of **3**.

6.2.4 Non-native vertebrate pest abundance survey

There were thirty (30) individual sightings of non-native animals over a combined total of one-hundred and fourteen (114) survey nights as part of preliminary baseline surveys (refer **Table 40**). Non-native predator species detected include, *Canis lupis familiaris* (wild dog) and *Felis catus* (domestic cat) (refer **Photo set 6**). Non-native herbivore species detected include, *Cervus elaphus* (red deer). Any non-native animal was recorded as a new individual if >1 hour had elapsed between sightings.

A baseline RAI was calculated using the formula **$RAI = D/TN \times 100$** , where D is numbers of detection and TN is the total number of camera-trap nights (all cameras combined). This methodology ensures that the surveys are representative of the entirety of the proposed offset area and are repeatable for future monitoring requirements.

The RAI for non-native predators was calculated at **2.63** (**Table 40**).

Table 40: Summary of Non-native pest survey results

Camera	Species	Survey Duration (nights)	Detection	RAI
1	<i>Cervus elaphus</i> (red deer)	19	12	
	<i>Felis catus</i> (domestic cat)		1	
	<i>Canis lupus familiaris</i> (wild dog)		1	
2	-	19	-	Predators
3	<i>Cervus elaphus</i> (red deer)	19	11	2.63
4	-	19	-	Herbivores
5	<i>Cervus elaphus</i> (red deer)	19	2	23.68
6	<i>Canis lupus familiaris</i> (wild dog)	19	1	
	<i>Cervus elaphus</i> (red deer)		2	
Total	3	114	30	





Photo set 6: *Canis lupis familiaris* (wild dog) and *Felis catus* (domestic cat) observed within the offset area via motion sensor camera traps.

6.2.5 Weeds Mapping

Ground coverage on-site is heavily dominated by pasture grasses as a result of historical land-uses including *Heteropogon contortus* (Black Spear Grass), *Aristida stricta* (Threeawn Wire Grass) and *Melinis repens* (Red Natal Grass) (refer **Photo set 7**). Patches of *Lantana camara* (Lantana) were observed across the offset area (refer **Photo set 8**). Native grasses were observed to dominate the ground cover across the offset site. **Table 41** presents the summary of weed coverage transect data.

Results of the six (6) weed cover transects all returned results ranging from 31.6% to 82.4% non-native coverage across the proposed offset area. The results of the baseline weed surveys are displayed on **Plan 16** and raw data is provided at **Appendix C**.

Table 41: Weed coverage transects summary

Location	Total dominant species coverage (%)			Area (ha)	Relative cover of non-native flora (ha)
	Non-native species	Native species	Bare Gound		
Transect 1	64.3	20.5	16.1	101.8	50.1
Transect 2	41.8	28.6	29.6		
Transect 3	45.0	36.3	18.7		
Transect 4	41.0	56.9	2.1		
Transect 5	31.6	62.3	6.1		
Transect 6	82.4	15.8	1.8		
Average	51.0	36.8	12.4		





Photo set 7: *Predominantly native grass across the offset area.*



Photo set 8: *Lantana camara patches across the offset area.*

16. OFFSET AREA BASELINE WEED MAPPING RESULTS



6.2.6 Summary of baseline scores for offset area

The overall habitat quality scores for MNES at the proposed offset area are presented in **Table 42** and **Table 43**.

Table 42: Offset area MHQA score summary – Koala

	AU1	AU2	AU3
Site Condition (/3)	1.15	1.51	1.54
Site Context (/3)	1.77	2.30	2.30
Species Stocking Rate (/4)	1.71	2.29	2.29
MHQA Score	4.64 (5)	6.10 (6)	6.13 (6)

NB: number in parentheses is rounded score

Table 43: Offset area FHA score summary – Grey-headed Flying-fox

	AU1	AU2	AU3
Site Condition (/3)	1.30	1.46	1.81
Site Context (/3)	1.75	1.75	1.75
Species Stocking Rate (/4)	1.20	1.20	1.20
MHQA Score	4.25 (4)	4.41 (4)	4.76 (5)

NB: number in parentheses is rounded score



7. Environmental Outcomes

This OMP identifies outcomes focused management actions pursuant the EPBC Act for the provision of koala (*Phascolarctos cinereus*) and grey-headed flying-fox (*Pteropus poliocephalus*), habitat offset (target MNES). The management objectives for the proposed offset area, in alignment with the Environmental Offsets Policy (EOP) will:

- Deliver an overall conservation outcome that improves the viability of habitat for the Koala.
- Provide a direct offset that is in proportion to the level of statutory protection that applies to target MNES.
- Be of a size and scale proportionate to the residual impacts on Koala habitat.
- Effectively account for and manage the risks of the offset not being successful within the required management timeframe.
- Provide a conservation gain additional to what is already required by a duty of care or to any environmental planning laws at any level of Government.
- Be efficient, effective, timely, transparent, scientifically robust and reasonable with appropriate transparent governance arrangements in place for measuring, monitoring, auditing and enforcing the management of the proposed offset area.

7.1. Koala

A summary of the baseline and improvement scoring for each assessment unit within the proposed offset area is outlined in **Table 44**. Detailed environmental outcomes showing the specific attributes which will be improved by the offset actions including interim milestones are provided at **Table 46** and **Table 47**.

Table 44: Koala baseline MHQA and offset improvement scores

MHQA Final Scores	AU1		AU2		AU3	
	Baseline	Uplift	Baseline	Uplift	Baseline	Uplift
Site condition (/3)	1.15	2.81	1.51	2.81	1.54	2.81
Site context (/3)	1.77	2.73	2.30	2.73	2.30	2.73
Species stocking rate (/4)	1.71	2.29	2.29	2.29	2.29	2.29
AU score	4.64	7.83	6.10	7.83	6.13	7.83
Rounded	5	8	6	8	6	8
Assessment Unit Area (ha)	36.3	36.3	50.5	50.5	14.0	14.0



7.2. Grey-headed Flying-fox

A summary of the baseline and improvement scoring for each assessment unit within the offset area is outlined in **Table 45**. Detailed environmental outcomes showing the specific attributes which are improved by the offset actions including interim milestones are provided at **Table 46** and **Table 47**.

Table 45: GHFF baseline FHA and offset improvement scores

MHQA Final Scores	AU1		AU2		AU3	
	Baseline	Uplift	Baseline	Uplift	Baseline	Uplift
Site condition (/4)	1.30	3.20	1.46	3.20	2.68	3.06
Site context (/3)	1.75	2.00	1.75	2.00	1.75	2.00
Species stocking rate (/3)	1.20	1.80	1.20	1.80	1.20	1.80
AU score	4.25	7.00	4.41	7.00	5.63	6.86
Rounded	4	7	4	7	6	7
Assessment Unit Area (ha)	36.3	36.3	50.5	50.5	14.0	14.0

7.3. Offset Assessment Guide – Calculator

Table 46 and **Table 47** outline a summary of the MNES offset compensation associated with the impacts. The offset compensation for the impacts on MNES is derived from the EPBC Offset Assessment Guide (OAG) calculator and habitat quality gains achieved from the successful implementation of the management actions.

Refer to **Appendix E** for the detailed EPBC offset calculator sheets and uplift tables.

Table 46: Summary of Koala offset compensation

Impact Area			Offset Area			
Impact Area	Impact Score	Quantum Impact Area	Habitat Gain (QI)	Quality	Offset Area (ha)	% of Impact Offset
19.1 ha	7/10	11.46 QI ha	AU1			
			5/10 to 8/10		36.3	68.48%
			AU2			
			6/10 to 8/10		50.5	63.51%
			AU3			



Impact Area	Offset Area		
	6/10 to 8/10	14.0	19.95%
	Combined Total		151.94%

Table 47: Summary of GHFF offset compensation

Impact Area			Offset Area			
Impact Area	Impact Score	Quantum Impact Area (QI)	Habitat Gain	Quality	Offset Area (ha)	% of Impact Offset
19.1 ha	6/10	11.46 QI ha	AU1			
			4/10 to 7/10		36.3	68.48%
			AU2			
			4/10 to 7/10		50.5	95.27%
			AU3			
			5/10 to 7/10		14.0	9.98%
Combined Total					170.73%	

7.3.1 Completion criteria

The management framework designed to achieve the proposed environmental outcomes summarised above are detailed in **Section 9** of this OMP.

A summary of the management actions and their completion criteria required to achieve the environmental outcomes are provided in **Table 48**. The management actions will result in a net gain of the overall habitat quality for Koala and GHFF over the period of effect of the offset through active management, maintenance, monitoring and reporting. It is important also to consider in the context of management actions the monitoring and reporting schedule outlined in **Section 8** and **Table 49**.

This OMP includes completion criteria and performance targets that evidence protection or improvement of Koala and GHFF habitat. For the purpose of the plan:

- completion criteria** are longer term time-bound values, specified for measurable parameters, that if attained and maintained ensure the plan's environmental outcomes are achieved; and
- performance targets** are time-bound short- and medium-term targets guided by prescribed management measures, for management interventions and environmental condition, that are used to monitor, evaluate, review and improve the effectiveness of the plan to offset impacts.

Refer to **Section 7 - 9** for species specific milestone frameworks. Here the intended goals for each assessment period have been provided at 5-yearly intervals (Years 5, 10, 15 and 20) for each of the MHQA



and FHA criteria, including justification for scoring uplift framed around specific management actions, milestone reporting and adaptive management criteria. It is understood these tables are typically incorporated into the EPBC Act approval.

Tracking of progress against the environmental outcomes will be measured at milestone monitoring years using the baseline survey methodologies detailed in **Section 6**. A schedule of monitoring and reporting is provided in **Section 8**.

As outlined within this OMP, conservation gains will be achieved for the relevant MNES via the following:

- Assisted regeneration – Assisted regeneration will improve habitat value for the Koala and Grey-headed Flying-fox by encouraging reestablishment of pre-clear Regional Ecosystems that support these species. This will be undertaken in all Assessment Units at the offset site (**Plan 11**).
- Infill planting – Infill planting will improve habitat value for the Koala and Grey-headed Flying-fox by re-establishing pre-clear Regional Ecosystems that support these species. This will be primarily undertaken within AU1 open paddocks, within bare areas that do not naturally regenerate within AU2 and AU3 (**Plan 11**).
- Weed and Pest Management – Weed and pest management will suppress threats to the Koala and Grey-headed Flying-fox and so allow for both the regeneration of their habitat and mitigation of potential adverse impacts to individual MNES through predation. Weed and pest management will be site-wide and as guided by **Section 9.7.2 Plan 17**.
- Fire management - will suppress threats to the Koala and Grey-headed Flying-fox and so allow for both the regeneration of their habitat and mitigation of potential adverse impacts to individual MNES through bushfire risk. The structure of the bushfire management regime will be set out in the Bushfire Management Plan as outlined in **Section 9.6**.
- Long Term Protection – Long term protection of the offset site will ensure the habitat for Koala and Grey-headed Flying-fox will be protected relative to existing provisions that allow for ongoing pastoral uses.

The detailed uplift tables provided at **Appendix E** explicitly set out the conservation gain for both Koala and Grey-headed Flying-fox in terms of the relevant habitat quality assessment methods, target gains, KPIs and adaptive management.



Table 48: Completion criteria and performance targets

Management Action	OMP Section	Performance Targets	Completion criteria
Management Action 1 – Legally Secure Offset Area	9.3	Not applicable	- The offset area is legally secured for conservation via a suitable method. This will be via a Voluntary Declaration (VDEC) process administered under the Queensland <i>Vegetation Management Action 1999</i> prior to the impacts occurring followed by a permanent mechanism agreed with the Department. - The Department is notified of the legal securement within 5 business days of commencing the implementation of the OMP <i>i.e.</i>, the date from which the offset area is legally secured. - The offset area is not used for other purposes – site access is restricted.
Management Action 2 – Non-native Vertebrate Pest Management	9.4	- Development and implementation of a property-wide feral animal management program specifying techniques (trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised will be completed within <u>Year 1 of the offset</u>. - A suitably qualified pest management contractor will be engaged to manage pests within the offset area for the life of the offset.	Pest control is implemented as set out under the management action and property-wide feral animal management program on detection of pests at the offset site.



Management Action 3 – Management of Weeds of National Significance (WONS)	9.5	- Establish photo monitoring locations in <u>Year 1 of the offset</u> to allow monitoring of any subsequent increase in WONS extent. - All WONS will receive on-going maintenance. - Follow-up treatment of WONS will occur <u>annually</u> or as determined by the suitably qualified regeneration contractor.	The management actions must maintain the extent of WONS weed cover below 5% of the offset area for the life of the offset (20 years).
Management Action 4 – Bushfire Management Plan	9.6	A Bushfire Management Plan (BMP) will be developed and implemented in accordance with relevant Queensland guidelines and endorsed by an experienced bushfire practitioner to reduce potential threats from fires to Koala and GHFF.	- Firebreaks and fuel loads are maintained through the life of the offset. - Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes.
Management Action 5 – Habitat Creation and Regeneration	9.7	By the end of Year 5, Site condition metrics for Koala and GHFF have improved in accordance with environmental outcomes (refer Table 49).	- Rehabilitated areas are established, regenerated and mapped as per milestone table outcomes. - Site condition metrics for Koala and GHFF improve in accordance with environmental outcomes (refer Table 49).
Management Action 6 – Fencing and Signage	9.8	Fencing and signage is installed and retrofitted by the end of <u>Year 1 of the offset</u> and maintained for the life of the offset (20 years).	- All fencing and signage has been installed, retrofitted and maintained for the life of the offset. - The risk of mortalities or injury to Koala and GHFF as a result of barbed-wire fencing is mitigated.



- Fencing enables Koala to move through the offset area and into surrounding land.
 - The risk of stock breaches or unauthorised access is mitigated. If stock breaches or unauthorised access is observed, fencing is rectified within 2 weeks.
-



8. Monitoring and Reporting Schedule

The timing and frequency of monitoring and reporting actions, corrective actions and responsibilities for the proposed offset area are provided in **Table 49**. The monitoring schedule is considered appropriate to allow the Proponent, Offset Provider and appointed suitably qualified person to assess the quality of the proposed offset area and success of management actions. In addition, if any non-compliances or ineffectiveness of management action are identified, adaptive management strategies can be implemented to ensure the proposed offset area will increase in quality for the target MNES.

Table 49: *Timeline for monitoring and reporting actions*

Management Action	Monitoring action(s)	Reporting Action and Timing	Responsible person(s) for activity/reporting
1. Legally secure offset area	The offset area will be secured via a suitable method. This will be completed via a Voluntary Declaration administered under the Queensland <i>Vegetation Management Act 1999</i> prior to impacts occurring followed by a permanent securing mechanism agreed with the Department	The Department will be notified that the offset area has been secured. Evidence in the form of the shapefiles and confirmation of declaration from the Queensland Department of Resources will be provided with the notification. Details will be included in the Annual Compliance Report (ACR).	Suitably qualified person as appointed by the Proponent.
2. Pest management	Monitoring will occur before the end of Years 5, 10, 15, and 20 and will include a repeat of baseline survey methodologies (i.e., motion triggered detection camera deployment) and sightings (direct	An OAAR will be completed annually within one (1) month of the end of each offset year detailing pest management implementation.	Offset Provider and Suitably qualified pest management contractor as appointed by the Offset Provider.



Management Action	Monitoring action(s)	Reporting Action and Timing	Responsible person(s) for activity/reporting
	and indirect) with evidence of non-native predators GPS recorded. Evidence of pest presence within the offset area and pest management implementation will be extracted from the Offset Area Annual Report (OAAR) and will be used in assessments of the relative success of the management of threats and progress towards the environmental outcomes and milestone criteria.	Milestone Reports will be prepared three (3) months after the completion of milestone surveys at Years 5, 10, 15, and 20 of the offset and included in the ACR.	Suitably qualified person as appointed by the Proponent.
3. WONS management	Weed cover surveys and mapping, and MHQA surveys will be conducted before the end of Years 5, 10, 15, and 20 of the offset in accordance with baseline survey methodologies to track progress against interim milestone targets and completion criteria, and identify any issues for rectification. The monitoring will be undertaken during the same time of year at every monitoring event, to ensure that the timing is consistent and aligns with the baseline assessment.	An OAAR will be completed within one (1) month of the end of each offset year detailing WONS management implementation, where required, and progress against the performance targets. OAARs will be included in the ACR. Milestone Reports will be prepared three (3) months after the completion of milestone surveys at Years 5, 10, 15, and 20 of the offset and included in the ACR.	Offset Provider and suitably qualified weed management contractor as appointed by the Offset Provider. Suitably qualified person as appointed by the Proponent.



Management Action	Monitoring action(s)	Reporting Action and Timing	Responsible person(s) for activity/reporting
4. Bushfire Management Plan	Annual monitoring requirements to review access tracks, fire breaks, seasonal fuel loads and outcomes of controlled burns or other management in accordance with the associated Bushfire Management Plan.	An OAAR will be completed within one (1) month of the end of each offset year which documents bushfire management actions undertaken under the direction of the local authority or in consultation with the Queensland Rural Fire Brigade. OAARs will be included in the ACR.	Offset Provider and suitably qualified bushfire management contractor as appointed by the Offset Provider.
5. Habitat creation and regeneration	Photo monitoring will be completed annually during the first three (3) years of the offset and documented in the OAAR. Photo monitoring will encompass areas of assisted natural regeneration and reconstruction to document on-ground progress. Photo monitoring coordinates are to be recorded and occur in the same location each survey period. Reconstruction areas subject to infill planting will be annually monitored after the completion of planting works until establishment is reached. The monitoring timing is dependent on the planting cycle of the engaged bush regeneration	An OAAR will be completed within one (1) month of the end of each offset year with input from the suitably qualified bush regeneration contractor to document: • Planting/seeding events • Watering schedule • Implemented corrective actions • Success/failure rates within initial maintenance period/watering period until establishment • Practical completion of planting works reported in the OAAR.	Offset Provider and / or suitably qualified bush regeneration contractor as appointed by the Offset Provider. Suitably qualified person as appointed by the Proponent.



Management Action	Monitoring action(s)	Reporting Action and Timing	Responsible person(s) for activity/reporting
	contractor. Monitoring will occur regularly after initial planting in accordance with watering schedules. MHQA surveys will be conducted before the end of Years 5, 10, 15, and 20 of the offset in accordance with baseline survey methodologies to track progress against interim milestone targets and completion criteria and identify any issues for rectification.	OAARs will be included in the ACR. Milestone Reports prepared three (3) months after the completion of milestone surveys at Years 5, 10, 15, and 20 of the offset and will be included in the ACR.	
6. Fencing and signage	Status of fencing and signage and any issues requiring rectification will be identified through regular site inspections to be determined by the Offset Provider.	Installation and maintenance of fencing will be reported in the Year 1 OAAR. Ongoing status of fencing/signage and any rectification works will be reported in OAARs for the relevant offset year and subsequently in the ACR for the project period.	Offset Provider

Monitoring Summary

Monitoring action	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10	Year 15	Year 20



Monitoring Summary

Pest monitoring	x	x	x	x	✓	✓	✓	✓
Weed photo monitoring	✓	✓	✓	x	x	x	x	x
Weed mapping	x	x	x	x	✓	✓	✓	✓
MHQA	x	x	x	x	✓	✓	✓	✓
Planting	x	✓	✓	x	x	x	x	x
Bushfire monitoring	Annually for the life of the offset							
Fencing and signage	Annually for the life of the offset							



9. Management Framework

This section outlines the management framework to be implemented for the life of the offset (20 years) including management measures to be implemented by the Offset Provider or appointed contractor, annual monitoring requirements, and interim milestone monitoring of environmental outcomes for relevant management actions to be completed by a suitably qualified person at Years 5, 10, 15, and 20 of the offset. These management actions are designed to minimise the risks associated with key threatening processes to the Koala and enhance the quality of the habitat within the proposed offset area. The proposed monitoring actions are summarised in a monitoring and reporting schedule in **Section 8**.

9.1. Management Approach

The measures outlined in the following subsections are considered effective for the listed status of the Koala in addition to the size and scale of the offset and the focus on priority management actions, which are efficient, timely and transparent (*i.e.*, able to be monitored and are auditable). Additionally, a number of these measures correspond to Priority Management Actions outlined in the following documents:

- *Approved Conservation Advice for Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory) (Koala Northern Designable Unit) (DAWE 2022)*
- *National Recovery Plan for the Koala Phascolarctos cinereus (DAWE 2022b)*
- *National Recovery Plan for the Grey-headed Flying-Fox (Pteropus poliocephalus)*

Although the measures have been developed to achieve the required offset environmental outcomes as a priority, they will deliver an overall improvement in the condition and quality of a wide range of native species present within the proposed offset area.

9.2. Operational Management Units

For the purpose of the management framework, the Assessment Units are termed Operational Management Units (OMUs). The consistent vegetation type and single assessment unit across the referral area results in a single OMU, details for the proposed offset area is provided in **Table 50**.

Table 50: Offset area operational management units

OMU	Assessment Unit	VMA Status	Regional Ecosystem	Area (ha)
OMU1	AU1	Category X	Non-remnant RE12.12.5	36.3
OMU2	AU2	Category X	Non-remnant RE12.12.5	50.5
OMU3	AU3	Category B	Remnant RE12.12.5	14.0



9.3. Management Action 1 – Legally Secure Offset Area

The proposed offset area must be protected and managed against known and potential threats for the target MNES in perpetuity to attain a conservation gain. As such, the proposed offset area will be legally secured for conservation prior to impacts occurring via a suitable method such as VDEC process administered under the Queensland VMA followed by a permanent securing mechanism agreed with the Department. Notification of declaration will be supplied to DCCEEW.

The declared area will be recognised as making significant contribution to the conservation of biodiversity. The Offset Provider will continue to manage the proposed offset area for the life of the offset, whilst reporting required milestones and data to the proponent annually. Legally securing the proposed offset area is listed in the Conservation Advice as a Priority Management Action, under “Habitat Loss, Disturbance and Modification”.

Demonstration of this management action will be provided in the Annual Compliance Report.

9.4. Management Action 2 – Non-native Vertebrate Pest Management

9.4.1 Justification

Wild dogs have been identified as a key threatening process under the EPBC Act and are confirmed as a direct predation risk to Koalas. Managing animal predation is listed as a Priority Management Action under the Koala Conservation Advice.

Additionally, the presence of other non-native predators which may pose a lower level of threat, such as *Felis catus* (feral cat), *Vulpes vulpes* (European red fox), and various species of feral deer, have the potential to attack and indirectly stress Koalas making them more susceptible to disease. Predation rates by wild dogs are difficult to quantify because attack often occurs in areas infrequently visited by people, and the carcasses of killed animals are buried, eaten, or may go undetected (Beyer *et al.* 2018). Wild dog attack is routinely cited as one of the main causes of mortality of Koalas (Rhodes *et al.* 2011; Gonzalez-Astudillo *et al.* 2017; Beyer *et al.* 2018). Wild dogs are also identified as regional pest species by Somerset Regional Council.

Removal of the wild dog threat produced significant gains in the survival of Koalas in a study where the causes of mortality of 291 Koalas were tracked over four years (Beyer *et al.* 2018). Wild dogs were confirmed as the cause of death for 117 (40.2% of total) deaths during the study. In addition, wild dogs were attributed to another 38 (13.1% of the total) deaths but were not confirmed. Population growth rates of Koala in the study increased from 0.659 in the first year to 1.20 in the fourth year of the project through a combination of reduction in predation and disease treatment. Modelling indicated that the population would increase in size by 21% within a decade with continued management (Beyer *et al.* 2018).

Key species assessed as high priority to receive management measures, and their associated risks, are presented in **Table 51**.



Table 51: Predator species management priorities

Priority (category)	Scientific name (Common name)	Queensland Biosecurity Act 2014 status	Risks (potential and actual)	Distribution and prevalence	Objective
1 (high)	<i>Canis familiaris</i> (Wild Dog)	Class 2	Actual impacts on agricultural production values – HIGH Actual impacts on native fauna – MEDIUM	Widespread occurrence in low to medium densities	Control
2 (medium)	<i>Felis catus</i> (Feral Cat)	Class 2	Actual impacts on native fauna – HIGH	Widespread occurrence in low to medium densities	Control
3 (medium)	<i>Vulpes vulpes</i> (Red Fox)	Class 2	Actual impacts on native fauna – MEDIUM Actual impacts on agricultural production values – LOW	Widespread occurrence in low to medium densities	Control

9.4.2 Baseline surveys

Wild dog presence within the proposed offset area was targeted through the use of motion-triggered baited camera traps. Camera trapping involves setting up a fixed digital camera to capture images or video of animals that pass in front of a camera with an infrared trigger. This survey technique identifies fauna activity beyond the scope of direct observational studies and with the absence of potential observer impacts. Cameras were attached 30-100 cm from the ground on a tree or post and directed towards landscape features. Six (6) camera traps were installed for 19 nights from 21st August 2025 to 9th September 2025, baited with chicken necks to target wild dogs and other known potential threats to MNES in the broader area. Multiple wild dogs were recorded within the proposed offset area on several occasions indicating a real risk to the Koala. Feral deer and European foxes have also been recorded during survey efforts across the broader offset property.

Baseline surveys and results are detailed in **Sections 6.1** and **Section 6.1.7**.



9.4.3 Proposed action and management measures

The control and prevention of invasive animal incursions will be undertaken in accordance with the relevant legislation (such as the Commonwealth *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015* and the *Queensland Biosecurity Act 2014*) and include the control of non-native predators by legal methods by suitably qualified pest management contractor(s). Any required hazardous materials must be handled and stored in accordance with the material's safety data sheets and the *Approved Code of Practice for the Storage and Handling of Dangerous Goods*. Non-native predator control will be undertaken in a humane manner.

Management measures will be implemented by the Offset Provider for the life of the offset (20 years) for the control of the pest species identified in **Table 51** across the proposed offset area include:

- Development and implementation of a property wide feral animal management program specifying techniques (trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) will be utilised, completed within Year 1 of the offset.
- Where necessary, adjacent land holders will be consulted for the potential of collaboration in a localised landscape-wide pest management effort. As vertebrate pest management is best achieved on a property-wide scale, this will occur across adjacent offset holdings at a minimum.
- Where necessary, cooperative participation in non-native predator management planning and implementation with local land managers (government departments, local governments and utility providers) will occur to ensure effective management in the locality of the offset area, being Somerset Regional Council.
- Signage installation informing that feral animal control being undertaken within the offset area.

Control methods to be implemented at the discretion of the suitably qualified pest contractor for predator species are listed in **Table 52**. These have been adapted from the *National Wild Dog Action Plan: Promoting and supporting community-driven action for landscape scale wild dog management* (WoolProducers Australia 2014). Any control methods will be used in consultation with local residents and authorities.

The implementation of the non-native vertebrate pest management actions will be reported annually by the Offset Provider in the Offset Area Annual Report and provide detail on detected species, control efforts, and total trapped/baited individuals during the given management period and identified trends of the population of non-native predators within the proposed offset area.



Table 52: *Predator species control methods - adapted from Wool Producers Australia 2014*

Method	Efficacy	Cost effectiveness	Target specificity	Humaneness acceptability	Comment
Ground baiting with 1080	Effective	Cost-effective	High	Conditionally acceptable	Currently the most cost-effective technique available. Poison baits are made from raw animal meat or offal or manufactured baits are used. Average and minimum weights vary between states. Sodium fluoroacetate (1080) is the main toxin used for control of wild dogs – reference to relevant State directions for use will be required.
Shooting to euthanise trapped dogs / fox / cats	Effective	Cost-effective	High	Acceptable	Effective technique although will require to be completed in accordance with existing State laws and guidelines.
Ground shooting	Can be effective to target individual dogs / foxes – largely opportunistic	Moderately expensive and time consuming	Moderate to high	Conditionally acceptable, dependent on skillset of shooter. Welfare issues arise if animal is not shot humanely	Limited effectiveness for broadscale population reduction, however, can achieve sustained control within a local area.
Exclusion fencing	Effective in suitable areas	Expensive	Can be effective in specific situations	Acceptable	Requires substantial resource input both initially, during installation, and in an ongoing capacity due to high maintenance requirements. Electric fencing can be an effective barrier when used appropriately and in conjunction with supplementary management techniques. Often adequate defence against reinvasion of controlled areas. Due to high levels of maintenance and upkeep required, fencing can be difficult to effectively maintain.



Aversion techniques	Not known	Not known	Not certain – possible short-term until target species become familiar with technique	Acceptable	Aversion methods include flashing lights, sounding alarms, objects flapping in the wind and chemicals.
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9.4.4 Adaptive management for non-native predator species

Given the extended management timeline, it is not possible or intended that this Offset Management Framework will provide a detailed prescription of management actions. This framework has been based on the current state of knowledge of species ecology and best practice habitat management approaches for Koala habitat. It is anticipated that new techniques will become available over the course of the management period to monitor environmental values through indicators including vegetation composition, Koala absence, presence and abundance, and weed presence or density (including level of infestation). In addition, given the variable nature of pest management, an adaptive management approach has been adopted to ensure the Pest Management Plan works effectively for any species over the area, as well as integrating future research and insights into management and monitoring actions. This will ensure best practice techniques can be adopted as new information becomes available over time via an adaptive management approach, ensuring the delivery and measurement of offset outcomes.

Adaptive management refers to a way of managing natural resources where management actions are regularly reviewed and, if necessary, modified, based on observed changes in environmental condition and/or updates in knowledge which underpins the original management approach.

Adaptive management will be used to incorporate changes into management processes across the proposed offset area, and will include the following:

- Assimilation of new data or information – such as updates to conservation advice or new threat abatement plans relevant to the Koala.
- Annual review of risks – to reassess existing risks/threats to the offset area and ensure best practice methodology is implemented to achieve effective management of target species.
- Annual review of management measure effectiveness – to reassess management actions where monitoring performance criteria are not met.

9.4.5 Milestone monitoring

A suitably qualified person will complete monitoring for non-native vertebrate pests before the end of Years 5, 10, 15, and 20 of the offset.

The following non-native predator monitoring methodology will be implemented by a suitably qualified person:

- Desktop Assessment
 - Review previous survey mapping and camera locations, field datasheets, photos and notes.
- Field Survey
 - Grid-based motion detection camera deployment for minimum of 22 nights in the same locations annually until 5-year milestone or performance criteria is achieved. Motion detection camera locations are to be recorded with hand-held GPS. GPS coordinates and photos to be recorded.
 - Field datasheet will detail the time of year of the monitoring event, record observed scats or tracks, photo location and notes of any evidence of positive and/or negative changes in non-native predator occurrence.



- A GPS will be used to locate the presence of non-native predator species, with a focus on species identified during baseline field surveys via notable tracks or scats.
- Transfer GPS data to spatial data programs to generate non-native predator occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes.
- Where non-native predator presence is detected, targeted trapping and baiting programs, will be implemented on completion of the monitoring program.

Milestone monitoring survey results will be reported by the suitably qualified person in the Year 5, 10, 15, and 20 Milestone Report and included in the ACR. This will provide detail on survey methodologies and detected predator abundance with reference to the baseline survey data.

9.5. Management Action 3 – Management of Weeds

9.5.1 Justification

The listing and prioritisation of WONS is a joint initiative of the States, Territories and Australian Government and their long-term control is of national interest. *L. camara* and its impact on Koala movement is listed as a key threatening process, prolonging time spent on the ground and therefore increasing susceptibility to predators (Paull *et al.* 2019, The Honourable Leeanne Enoch 2019). The Queensland Koala Strategy 2019–2024 lists Koala habitat restoration, including removal of weeds, as a key priority, and these recommendations were developed at the advice of the Koala expert panel (Queensland Government 2019).

As well as limiting movement for Koalas and other fauna, *L. camara* also changes the structure and health of the ecosystem, which can lead to a decline in the health and quality of Koala food and habitat. *L. camara* is a transformer weed, altering wildfire behaviour, potentially resulting in destruction of native trees on a larger scale (Berry *et al* 2011, DAF 2016). *L. camara* also suppresses eucalypt recruitment, both through its allelopathic properties and its capacity to shade out other species. Without management intervention this leads to an overall decline in habitat health (Threatened Species Scientific Committee, 2010). If eucalypt species cannot recruit the succession of vegetation is interrupted, threatening the future health of the ecosystem.

Weed control is fundamental to improving biodiversity and the ecological condition of the habitat within the offset area. Historical land uses across the proposed offset area have resulted in the introduction and spread of a variety of environmental weeds. Weeds recorded on-site are generally confined to ground cover species such as pasture grasses which dominate the area. *Lantana camara* (Lantana), a WONS, is a persistent weed in SEQ and is widespread across the broader Little Kipper Creek Offset Property. However, *Lantana camara* (Lantana) was recorded in only very low abundance within the proposed offset area, likely a result of continued cattle grazing and dominance of pasture grasses. Nevertheless, the ongoing maintenance of <5% WONS is considered relevant, particularly given the potential for *Lantana camara* (Lantana) to seed from adjacent dense patches and quickly spread. Germination can occur rapidly after wet weather or when a parent plant is removed. Therefore, on-going repeat visits to the offset area following are required to maintain low abundance of *Lantana camara* (lantana).



9.5.2 Proposed action

The majority of weeds recorded on-site are ground cover species indicative of cattle grazing country. As such, the suppression of weeds will likely occur following the reinstatement of native vegetation and canopy cover. Direct weed control will be implemented where necessary to achieve the scoring as proposed in **Table 46**. Given the potential for *Lantana camara* (Lantana) infestation to occur, future works will be adaptive and any new infestations of *Lantana camara* (Lantana), or any other WONS, will be prioritised. Weed management strategies for Lantana specifically are listed in **Table 53** and other WONS in **Table 54**.

The management actions must maintain WONS weed cover below 5% over the entire offset site by Year 10 of the offset, as detailed in the environmental outcomes (refer **Section 7**). The timing for the implementation of management measures includes:

- Establish photo monitoring locations
- Treatment of WONS will occur annually and where needed.

Table 53: *Lantana management methods*

Type of infestation	Physical	Mechanical	Chemical	Fire	Biological
Small (few plants, small area)	Hand grubbing only suitable for seedlings. Wear gloves for protection from thorns.	Not suitable.	Spot spray plants less than 2 m in height between summer and autumn with a registered herbicide.	Not suitable.	There are four useful biological control agents. They are already distributed throughout their potential range.
Medium (medium density, medium total area)		Bulldoze, plough, stick-rake or slash infestations. Soil disturbance will lead to mass seed germination, so follow up with further controls. Do not use mechanical control in areas susceptible to erosion. A permit may be required.	Spraying is uneconomical for medium or large infestations. Helicopter spraying is used when there is no access for mechanical control, eg very steep slopes.	Under permit, burn in summer with good fuel load of grass and/or mechanically cleared lantana. Also use as follow-up. Do not burn in rainforests.	
Large (many plants, many ha)					

Note: table extracted from CRC for Australian Weed Management, 2003, *Weed Management Guide, Lantana – Lantana camara*, Commonwealth Department of the Environment and Heritage.



Table 54: Weed treatment and removal methods

No.	Family	Scientific name	Common name	Non-chemical control	Chemical control
1	Amaranthaceae	<i>Alternanthera philoxeroides</i>	Alligator Weed	Refer to Business Queensland: Invasive Plants at https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/landmanagement/health-pests-weeds-diseases/weeds-diseases/invasive-plants for additional guidance. Or WONS weed management guides available at https://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority issued off-label permit where applicable. Also refer to: Business Queensland: Invasive Plants at https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/landmanagement/health-pests-weeds-diseases/weeds-diseases/invasive-plants
2	Gramineae	<i>Andropogon gayanus</i>	Gamba Grass		
3	Annonaceae	<i>Annona glabra</i>	Pond Apple		
4	Basellaceae	<i>Anredera cordifolia</i>	Madeira Vine		
5	Asparagaceae	<i>Asparagus aethiopicus</i> cv. <i>Sprengeri</i>	Asparagus Ground Fern		
6	Asparagaceae	<i>Asparagus africanus</i>	Ornamental Asparagus, Asparagus Fern		
7	Asparagaceae	<i>Asparagus asparagoides</i>	Bridal Creeper		
8	Asparagaceae	<i>Asparagus declinatus</i>	Bridal Veil, South African Creeper		
9	Asparagaceae	<i>Asparagus plumosus</i>	Asparagus Fern		
10	Asparagaceae	<i>Asparagus scandens</i>	Climbing Asparagus Fern		
11	Cactaceae	<i>Austrocylindropuntia</i> spp.	Prickly Pears		
12	Cabombaceae	<i>Cabomba caroliniana</i>	Cabomba		
13	Asteraceae	<i>Chrysanthemoides monilifera</i> subsp. <i>Monilifera</i>	Boneseed		
14	Asteraceae	<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush		



No.	Family	Scientific name	Common name	Non-chemical control	Chemical control
15	Asclepiadaceae	<i>Cryptostegia grandiflora</i>	Rubber Vine		diseases/invasive-plants for additional guidance. Southeast Queensland Ecological Restoration Framework WONS weed management guides available at https://www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html
16	Cactaceae	<i>Cylindropuntia spp.</i>	Prickly Pears		
17	Fabaceae	<i>Cytisus scoparius</i>	Common Broom		
18	Bignoniaceae	<i>Dolichandra (Macfadyena) unguis-cati</i>	Cat's Claw Creeper		
19	Pontederiaceae	<i>Eichhornia crassipes</i>	Water Hyacinth		
20	Fabaceae	<i>Genista linifolia</i>	Flax-leaved Broom, Mediterranean Broom		
21	Fabaceae	<i>Genista monspessulana</i>	Montpellier Broom, Cape Broom, Canary Broom		
22	Poaceae	<i>Hymenachne amplexicaulis</i>	Hymenachne		
23	Euphorbiaceae	<i>Jatropha gossypifolia</i>	Bellyache Bush		
24	Verbenaceae	<i>Lantana camara</i> var. <i>camara</i>	Lantana		
25	Solanaceae	<i>Lycium ferocissimum</i>	African Boxthorn		
26	Mimosaceae	<i>Mimosa pigra</i>	Giant Mimosa		
27	Gramineae	<i>Nassella neesiana</i>	Chilean Needle Grass		
28	Gramineae	<i>Nassella trichotoma</i>	Serrated Tussock		
29	Cactaceae	<i>Opuntia spp.</i>	Prickly Pears		
30	Cactaceae	<i>Parkinsonia aculeata</i>	Parkinsonia		



No.	Family	Scientific name	Common name	Non-chemical control	Chemical control
31	Asteraceae	<i>Parthenium hysterophorus</i>	Parthenium Weed		
32	Mimosaceae	<i>Prosopis pallida</i>	Algaroba		
33	Rosaceae	<i>Rubus fruticosus aggregate</i>	Blackberry		
34	Alismataceae	<i>Sagittaria platyphylla</i>	Delta Arrowhead, Arrowhead, Slender Arrowhead		
35	Salicaceae	<i>Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii</i>	Willows (except Weeping Willow, Pussy Willow and Sterile Pussy Willow)		
36	Salviniaceae	<i>Salvinia molesta</i>	Salvinia		
37	Asteraceae	<i>Senecio madagascariensis</i>	Fireweed		
38	Solanaceae	<i>Solanum elaeagnifolium</i>	Silver Nightshade		
39	Tamaricaceae	<i>Tamarix aphylla</i>	Athel Pine		
40	Fabaceae	<i>Ulex europaeus</i>	Gorse, Furze		



Weed notes

Weed management typically comprises a major part of rehabilitation site works. Weed management provides the basis of aiding natural regeneration and assisted natural regeneration.

Weed Management will be undertaken in accordance with the SEQERF Primary, Follow-up and Maintenance works notes above targeting WONS.

Critical skills for Weed Management include:

- Knowledge of relevant legislation.
- Plant Identification skills.
- Knowledge of different weed management techniques.

Knowledge of different weed management techniques

A range of weed management techniques are available to combat varying weed species and scenarios. Refer to the following **Table 55** for a summary of contemporary weed management techniques extracted from the SEQERF.

Table 55: Weed treatment schedules (source: SEQERF)

Method	Description
Herbicide	The herbicide weed control techniques described below provide a range of proven methods that can be used on a restoration site
Cut- scrape - paint	Cut the stem of the plant close to the ground (approximately 1-2cm) ensuring that soil does not come in contact with the cut surface. The cut can be made at a slight angle in order to increase the surface area that is exposed to the chemical. Apply herbicide immediately to the cut stump using poison pot and brush or dripper bottle. Using a knife, scrape the sides of the stump thoroughly to expose the green tissue. Apply herbicide to the scraped stump. The chemical must be applied within 10 seconds of the cut or scrape being made in order for it to be fully effective.
Cut- paint	Cut the stem of the plant close to ground level. Apply herbicide to the cut stump using poison pot and brush or dripper bottle. This method is best suited to easy-to-treat weeds such as small-leaved privet (<i>Ligustrum sinense</i>), provided that the diameter of the stem at ground level is less than approximately three centimetres. If a glyphosate-/ metsulfuron methyl herbicide mix is being used in the poison pot, a greater range of weeds can be controlled using this method e.g., Easter cassia.
Scrape - paint	Scrape as much of the stem as possible (one side of the stem) using a knife and apply herbicide to the scrape. Leave a small section of the vine unscraped, and then twist the vine so that the next scrape is made on the opposite side of the stem to the preceding scrape. Continue along the length of the vine, scraping and painting as much of the stem as possible, with scraping to be concentrated along the thicker stems close to the root of the plant. This is the best method to use for madeira vine, as it allows the chemical to translocate to the underground storage



Method	Description
	organs and aerial tubers which may be hanging in large clusters above head height. This avoids the potential problem of tubers from cut stems left hanging in the trees from dropping to the ground and sprouting. When scraping madeira vine stems a deep scrape is advisable - scrape right through to the fibrous, stringy section of the stem, taking care not to sever the vine. This method is also suitable for treatment of ochra.
Over-spraying	Over-spraying involves the use of knapsacks or power sprayers to treat large expanses of weed such as lantana thickets. The foliage must be covered with herbicide but not to the point of running off the plant. The dead plants remain in place and can be cut down at a later stage. Prior to over-spraying, any weeds that are growing closely around established native plants must be hand removed or treated by cut-scrape-paint.
Oil-hang	Vines such as mile-a-minute (<i>Ipomoea cairica</i>) which produce long stolons extending many metres along the surface of the ground, are suited to the oil- hang method. Locate the base of the plant and carefully pull up the runners and roll them up. The resulting roll of vine is then hung in the fork of a tree to dry out as if it is left on the ground it is likely to re-shoot. Where runners are climbing up into a tree they are cut off at head height prior to the runner being rolled up - there is no need to pull cut vines down from trees as this action is likely to damage the tree. The base of the vine is treated using the cut scrape- paint method.
Gouge-paint	This method applies to plant species that have a fleshy underground storage organ, such as the large tuber that is often found at the base of madeira vine. It is also particularly appropriate for the treatment of climbing asparagus (<i>Protasparagus plumosus</i>). If using this technique on climbing asparagus, first cut the stems that are growing into the canopy at head height and also at the base. The fleshy rhizome can then be gouged, or alternatively in the case of climbing asparagus, it can be struck several times firmly with the head of a pair of loppers, allowing the brown outer covering of the crown to peel away exposing the white fleshy inner section of the rhizome for application of herbicide. Gouge out sections of the fleshy base with a knife and apply herbicide using a paint pot and brush or dripper bottle within 10 seconds
Basal Barking	This method involves mixing an oil soluble herbicide in diesel/kerosene and painting or spraying the full circumference of the trunk or stem of the plant from ground level to a height of approximately 45cm. Basal bark application is suitable for thin-barked woody weeds including saplings, regrowth and multi- stemmed shrubs. The method will usually result in the mortality of difficult-to- control woody weeds at any time of the year, provided the bark is not wet or too thick to enable the herbicide to penetrate. The method is not to be used in wet weather, adjacent to waterways or in areas where native trees and shrubs are located. The use will



Method	Description
	be restricted to situations where a weed is particularly difficult to control e.g., cherry guava and where other methods have been unsuccessful.
Splatter Gun	This small gas-powered injector kit is fitted into a knapsack for easy carrying and delivers large droplets in a stream over the weed. The gun is used to deliver a concentrated herbicide (glyphosate or metsulfuron methyl) across large dense expanses of weed. This method is used for species such as lantana (ratio of 1:9 of glyphosate water). Splatter gun involves spraying strips at one to two meter intervals over the thicket. The herbicide is then translocated throughout the entire plant. The method does not require the whole plant to be covered as in over-spray
Spot-spraying	A knapsack filled with an appropriate herbicide mix is used by the operator to selectively control environmental weeds. A keen eye and an ability to distinguish between the native and weed species likely to be present, especially at seedling stage, is essential. Marker dye is added to the chemical mix to allow the operator to see what has already been sprayed, thus covering the ground weeds comprehensively and thoroughly Glyphosate and metsulfuron methyl are the main herbicides used for spot-spraying in ecological restoration, together with the addition of a penetrant and/or surfactant and marker dye
Stem Injection	Large woody weeds such as camphor laurel, coral trees (<i>Erythrina spp.</i> , <i>Privet Ligustrum spp.</i>) and umbrella trees are generally treated by stem-injection. Holes are drilled at regular intervals around the base of the tree and exposed roots using a drill. A tree injection syringe attached to a small capacity knapsack is used to fill the holes with herbicide. Stem-injection of trees can also be undertaken using a hatchet to create cuts in a brickwork pattern in trunks of trees for the application of herbicide (known as tree filling). Frilling is more labour intensive than drilling. The greatest benefit of stem injection is that the trees can be left standing in situ as they die, provided there is no risk to humans or infrastructure from falling limbs. This creates convenient roosts for birds and other animals, and prevents the formation of large amounts of debris on the ground and damage to understorey plants which would result if the trees were to be cut down using a chainsaw.
Wick Wiping	Wick wipers can be manually used with a sponge or wick applicator, attached to a container filled with herbicide or as an attachment towed by a tractor. The manual method can be used to selectively apply herbicide to the leaves of weeds growing in sensitive situations. The hand held container can leak and generally spot spraying would be undertaken. The use of a tractor drawn wick wiper is used to control taller growing species such as introduced grasses and to encourage the growth of lower growing species. This method could be used in preparation for planting.
Mechanical	Mechanical weed control involves the use of powered and non-powered equipment such as brushcutters, chainsaws, slashers, shovels, pruners, saws,



Method	Description
	etc. These methods are best used in situations where there is a large, uninterrupted stand of weeds.
Dig and Bag	Dig and remove tuberous/ rhizomatous root systems. Remove roots or whole plant in hard/ compacted soils. Place in suitable container and remove from site, dispose of by deep burial, burn or burial at a land fill, must not place declared weed species in recycling (mulch).
Hand-pull	Remove totally from ground by hand (human). Perform when soil is moist. Applicable to small infestations or areas of environmental sensitivity (including sensitive watercourses, when frogs are breeding, or presence of threatened species).
General Mechanical	Involves use of machinery (e.g., brushcutter, chainsaw, slasher, dozer, excavator). Suitable for large infestations and weed trees. Initially cost-effective, but requires immediate revegetation of site or matting/ mulch application and extensive maintenance periods, Generates excessive soil and vegetation disturbance

Hygiene Protocols

The following weed hygiene protocols identified by Biosecurity Queensland will be implemented:

- Vehicle clean down prior to entering site by blowing, vacuuming or washing off dirt and seed
- Contact landholders before entering properties and check site specific requirements before entry
- Dispose of weed waste appropriately at a waste facility or by burning or burying

9.5.4 Milestone monitoring

A suitably qualified person will complete monitoring for WONS before the end of Years 5, 10, 15, and 20 of the offset to track against the interim milestone and completion criteria in the environmental outcomes as outlined in **Table 48**. Detailed surveys are also to be undertaken at Year 8 to ensure WONS cover remain below 5% over the whole offset area.

The methodology for non-native plant survey will be repeated by the suitably qualified person in accordance with the monitoring and reporting schedule in **Section 8**. Surveys include the search and recording of infestations and MHQA transects to record weed cover. The following procedures will be implemented to ensure that the monitoring events align with the baseline survey methodology:

- Desktop Assessment
 - Reviewing previous survey mapping, field datasheets, photos and notes including WONS priority areas where applicable.
 - Reviewing weed and bush regeneration records for the last year.
- Field Survey
 - MHQA transects are carried out at baseline survey locations,



- Utilising the weed cover assessment methodology discussed in **Section 6.1**, inspect previously identified weeds infestations. Mapping of any new WONS infestation areas using GPS unit and quantify using weed cover transects.
- Record non-native flora species list,
- Provide photo monitoring at established locations to be set up in Year 1 of the offset with photo location and direction, and
- Notes of any notable positive and/or negative changes in weed density and coverage.

Milestone monitoring survey results will be reported by the suitably qualified person in the Year 5, 10, 15, and 20 Milestone Report and included in the ACR. This will provide detail on survey methodologies and detected predator abundance with reference to the baseline survey data.

9.6. Management Action 4 – Bushfire Management Plan

9.6.1 Justification

Fire management of the Offset Area is critical to achieving the intended outcomes and conservation gains over the management period. Managing the vegetation to promote natural regeneration and reduce the impacts of uncontrolled wildfire within the Offset Area will ensure management objectives are achieved. Uncontrolled wildfire is considered a key threat to Koala populations, with impacts inclusive of mortality, injury, and loss of or altered habitat resulting in a reduction in food source and potentially increased exposure to predators.

The management measures contained in this OMP will be used to assess baseline fuel loads and indicate management techniques and planning, specific to the Offset Area in the context of the surrounding landscape. The overall objective is to prevent fire-induced Koala mortality via targeted fuel hazard reduction and prescribed fire management. Managing the vegetation to promote natural regeneration and reduce the impacts of uncontrolled wildfire within the Offset Area will ensure management objectives are achieved.

Under current Queensland legislation, landowners are required to prepare and plan for bushfire hazards by being aware of fire management issues in the area, trimming trees, mowing grass, removing flammable material around the home, and clearing vegetation, particularly if land boundaries are shared with bushland. It is important to balance undertaking these activities and preventing harm to the natural environment and areas of cultural heritage. This can be achieved through property planning or preparing and implementing a land and water management system. At present, the proposed Offset Area and broader offset property has internal tracks and access along existing fence lines that may act as fire trails. Specific actions as directed by the local authorities must be implemented which may include prescribed burning or other techniques undertaken as directed by the Bushfire Management Plan as well as the local authority.

9.6.2 Proposed action and management measures

A specific Bushfire Management Plan (BMP) will be developed by qualified bushfire consultants in Year 1 of the offset. The purpose of the BMP will be to guide fire management on the Offset Property to manage



the risk of high intensity fire impacting vegetation communities and associated fauna species including koala, greater glider and grey-headed flying fox. The BMP principles will aim to enhance bushfire resilience and vegetation community health through fuel load management, risk-reduction measures and appropriate fire regimes. The BMP will combine information from a variety of sources including land manager discussions, industry best practice, This OMP, as well as the following technical documents:

- Queensland Fire and Emergency Services. (2020). Queensland Bushfire Plan.
- Queensland Parks and Wildlife Services (QPWS) Bioregional Planned Burn Guidelines
- Queensland Parks and Wildlife Service. (2022). Planned Burn Guidelines: Introductory Volume.
- Queensland Parks and Wildlife Service. (2022). Planned Burn Guidelines: Southeast Queensland Bioregion of Queensland.
- Queensland Parks and Wildlife Service. (2012). Planned Burn Guidelines - How to Assess if Your Burn is Ready to Go. www.bom.gov.au
- Queensland Parks and Wildlife Service. (2012). QPWS Planned Burn Fire Behaviour Tables.
- Queensland Fire and Emergency Services. (2019). Bushfire Resilient Communities (BRC) Technical Reference Guide for the State Planning Policy State Interest "Natural Hazards, Risk and Resilience Bushfire.
- Australasian Fire Authorities Council (AFAC) National Burning Project.
- Queensland Fire and Biodiversity Consortium (2022). Burnett Mary Fire Management Guidelines

The BMP will include the following components, with further initial detail on some of these components in the below sections:

- Fire management for MNES: Description of fire management considerations for koala, grey-headed flying fox and greater glider, including threats from inappropriate fire regimes.
- Bushfire hazards: A comprehensive landscape-scale assessment and historical review of the key factors characterising the area's bushfire risk, including fire weather, topography and fire history. Site fuel load assessment. A brief description of hazards on the Offset Property is provided in below.
- Operation fire management units (FMUs): outlining site fire management activities including but not limited to weed management, stock grazing and planned burning for fuel reduction and ecological management, access and fire break maintenance and habitat protection measures (further detailed below).
- Fire management plan: Provides a land management plan which outlines Fuel Management Units, including land management zones (including operational and site information).
- Monitoring and maintenance schedule: Describing an approach for adaptive management and monitoring to evaluate the effectiveness of fire management regimes and land management activities (monitoring methods outlined below).

Bushfire risk areas and potential ignition sources

External

The Offset Property is bordered by rural pastoral land to the north-west and south-west, and by extensive areas of native vegetation to the north-east and south-east associated with remnant rangelands. These



surrounding land uses present potential pathways for bushfire to originate outside the Offset Property and enter the site, particularly under elevated fire weather conditions.

Higher external bushfire risk is associated with:

- Northern most portion of the property where remnant vegetation connects the Offset Property to continuous native remnant vegetation outside of the property, increasing the potential for large landscape scale fires to enter the site.
- Eastern, southern, western and northern boundaries, where fire may originate from neighbouring rural properties due to pasture management activities, machinery use or escaped planned burns; and
- Roadside corridors and access tracks adjoining or entering the Offset Property, which may act as ignition sources during periods of high fire danger

Internal

Potential sources of bushfire ignition within the Offset Property include:

- Escaped planned fire management activities, including ecological or hazard reduction burning.
- Operational activities, such as use of farm machinery and vehicle movements along internal tracks.
- Natural ignition sources, including lightning strikes, particularly along ridgelines and elevated areas; and
- Accumulated fine fuels, including grasslands, regrowth areas and edge interfaces between cleared land and remnant vegetation.

Bushfire hazard characteristics

Bushfire behaviour across the Offset Property is influenced by fuel, weather and topography. Fuel loads vary spatially and include heavily grazed areas, ungrazed grasslands, regenerating vegetation and remnant woodland. Areas of steeper terrain and woody vegetation, particularly along western ridgelines and vegetated creek lines, present a higher potential bushfire intensity.

Much of the Offset Property is mapped as a Bushfire Prone Area under the State Planning Policy. Mapping indicates areas of Very High and High Potential Bushfire Intensity associated with woody vegetation on rugged terrain, with Medium Potential Bushfire Intensity generally occurring along vegetated drainage lines.

Existing access tracks and cleared areas provide opportunities for fire containment and suppression, subject to prevailing fire weather conditions and fire behaviour.

Fire management across the Offset Property will prioritise asset protection and prevention, with the offset values and restoration areas treated as critical assets requiring protection from high-intensity or unplanned fire.

Fire access, breaks and water resources

Site access and fire management lines

The Offset Property contains an established network of internal access tracks and entry points that provide access for land managers and emergency services. These tracks also function as fire management lines, enabling fire suppression access and assisting in fire containment during bushfire events.



Boundary fire breaks

Fire breaks are located along portions of the property boundaries and internal interfaces and will be maintained to reduce the risk of fire entering or exiting the Offset Property. Boundary fire breaks may comprise cleared lines, managed grazing areas or existing tracks and will be managed in a manner that balances bushfire risk reduction with protection of environmental values.

Water resources and fire management infrastructure

Several farm dams, water bores and water storage tanks are located across the Offset Property. These water sources may provide suitable access points for fire management vehicles and emergency services during bushfire suppression activities.

The approximate locations of existing water resources are identified to support fire response planning. Locations for temporary or permanent fire management infrastructure, including additional water tanks or equipment storage areas, will be further assessed and refined through the development of the BMP.

Protection of revegetation and rehabilitation areas

Fire management will specifically address the heightened vulnerability of developing revegetation and rehabilitation areas, which are at increased risk of damage from unplanned or high intensity fire, particularly during early establishment phases. Fire regimes will be designed to minimise the likelihood of fire impacting these areas until vegetation communities have sufficiently matured.

Protection of restoration areas is critical to achieving offset objectives and will be a key consideration in fire management planning, prioritisation of suppression response and selection of fuel management techniques.

Fuel management

Various techniques are used to reduce and manage the fuel load within the landscape or modify the connectivity between fuel layers (Queensland Fire and Emergency Services, 2020). Fuel management techniques include the following (to be further detailed in the BMP):

- Stock grazing to manage near surface fuel loads (only to be undertaken under an approved Livestock Management Plan).
- Appropriate planned burn regimes to reduce fuel loads, control fire susceptible weeds and/or maintain ecological processes (to be detailed in BMP), and
- Targeted chemical or mechanical weed management and removal.

It is acknowledged that the primary aim of the Offset Property is to manage habitat and food resources for MNES, therefore fuel management will be implemented as part of an integrated land management approach that aims to appropriately manage the offset site values and risk profile.

In addition to a BMP, a Livestock Management Plan (LMP) will be developed by the Offset Provider to guide livestock management across the Offset Property. The plan supports the integration of low intensity, rotational grazing as a bushfire fuel load management tool while ensuring that grazing activities do not compromise ecological values or biodiversity outcomes identified in approved OMPs.



The LMP will be action based and will align with SMART principles as well as sustainable grazing principles and recent ecological research that supports the compatibility of strategic grazing with biodiversity conservation. Strategic, rotational grazing is used to manage groundcover, reduce fuel loads, and support regeneration of eucalypt woodlands.

Key features of the LMP will include:

- Defined objectives that support ecological regeneration through planned grazing.
- A rotational grazing regime based on measurable triggers (i.e. tree height, fuel load levels).
- Fencing strategies to control livestock access.
- A comprehensive monitoring framework covering tree recruitment, fuel loads, habitat quality, and pasture health.
- Corrective actions and adaptive management protocols in response to trigger events.

As well as this, the LMP will provide detailed information on how grazing will occur across the site including but not limited to:

- Demonstrate why grazing is the most effective and most appropriate strategy for reaching the proposed conservation gains.
- The number and species of livestock to be used for grazing.
- Triggers to introduce grazing, and triggers to remove grazing once an acceptable fuel load has been reached (either to/from management zones or the site entirely).
- If seasonal changes to grazing thresholds are required based on fuel load variation.
- How grazing has been considered in conjunction with other fire management strategies and management zones.
- How livestock movement will be monitored and controlled and at what frequency.
- Where livestock will be kept when grazing is not required by the offset.
- Where grazing is a listed threat in the recovery plan of an MNES, provide a discussion on how the grazing will be implemented such that MNES will not be threatened by its ongoing presence.
- Given the risk of trampling new growth, demonstrate how grazing will be excluded from any areas within which revegetation is occurring until it is of a size that grazing no longer poses a risk.

The plan will also ensure full alignment with Commonwealth approvals for each offset located on the Offset Property, detailing specific commitments, monitoring protocols, and reporting obligations. All activities under the LMP will be documented in annual Offset Area Assessment Reports, ensuring transparency and accountability.

Grazing in the Offset Area as per the above will only occur upon approval of the LMP by the Department.

9.6.3 Monitoring and reporting

Monitoring and adaptive site management will be incorporated into the management of bushfire risk within the Offset Property to assess the effectiveness of management activities. Specifically, monitoring will occur prior to and after implementing planned burns, as well as ongoing monitoring of vegetation and fuel condition during rotational grazing (monitored under LMP). The adaptive management program may pose simple questions such as those provided below, or more complexed assessment. For example:

- Was the fuel hazard reduced to the targeted level for the FMU?



- Did the management activity contribute to a fire regime that is maintaining offset targets and environmental values?
- Did target regrowth or planted canopy species of a specific size survive the management activity?

If the answer to these questions is no, then adjustments to the land management actions or schedule will need to be made. The fuel hazard, vegetation condition and fire management tracks will be comprehensively assessed annually, as well as periodically as part of regular property activity, and especially before the start of the bushfire season (August – November).

Fuel hazard monitoring

Fuel hazard monitoring within each FMU (to be determined in the BMP) can be used to identify triggers for implementing proposed fuel reduction measures to evaluate the effectiveness of these measures. The Overall Fuel Hazard Assessment Guide (OFHAG) (Hines et al., 2010) provides a quick and representative estimate of fuel hazard on site that can be used for ongoing fuel hazard monitoring to inform management intervention. The OFHAG methodology is based on the structure and availability of fuels within various strata categories (bark, elevated, near surface and surface) and is widely used by land managers across southeast Queensland. The BMP will detail the proposed fuel management prescriptions and monitoring triggers for each FMU. Fuel hazard monitoring will be done annually for the life of the offset.

Water reserve monitoring

The BMP will identify all available water sources within the Offset Area and the broader property. The BMP will include the requirement for monitoring water source condition, accessibility and capacity, and for undertaking maintenance necessary to support the availability of water reserves for bushfire management.

9.7. Management Action 5 – Habitat creation and regeneration

9.7.1 Justification

Habitat creation and regeneration is a key management action that will improve existing habitat values within the proposed offset area and expand habitat values in areas that have been subject to weed infestation. In addition, regeneration is a Priority Management Action listed under “Habitat Loss, Disturbance and Modification” of the Conservation Advice for the Koala. Rehabilitation aims to enhance degraded areas through assisted natural regeneration and Management Action 3 which will continue to manage WONS. Assisted natural regeneration applies to areas where the native plant community is largely healthy and functioning or where native plant seed is still stored in the soil, can easily disperse from nearby natural areas, or be readily dispersed by animals. It is applied when limited human intervention, such as weed control, minor soil amelioration, fencing works or cessation of slashing etc., is enough to trigger the recovery process and natural regeneration. Planting occurs where necessary and does not interfere with natural process.

Management Actions 3 to 5 will work together to improve habitat quality through weed removal/control, bushfire management and native species establishment.

9.7.2 Management actions

Operational Management Units listed in **Section 9.2** will be established across the offset area and range from higher quality remnant vegetation to non-remnant vegetation. As such, the key management actions



across the OMUs will differ (refer below and **Table 56** for summary). Key management actions will include assisted natural regeneration practises to expand patches of regrowth throughout areas where high levels of weed management is required. Reconstruction and infill planting will be applied within the non-remnant and historically cleared areas to assist in vegetation coverage and composition.

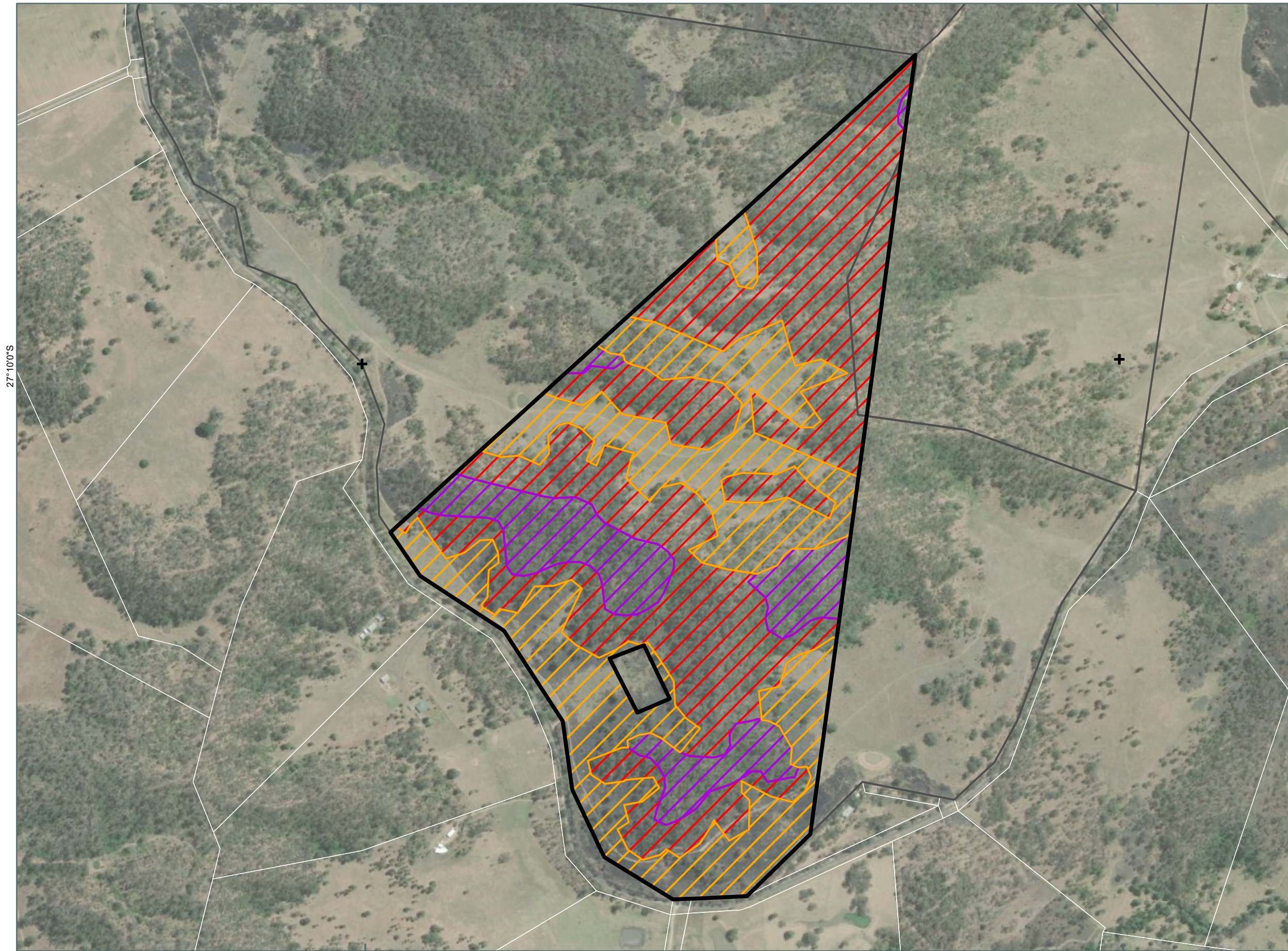
OMUs and rehabilitation areas are shown on **Plan 17**.

Table 56: Operational management unit rehabilitation method summary

OMU	Description	Rehabilitation Method
Remnant vegetation area (OMU 1)	Discontinuous canopy vegetation	• Weed removal/control • Bushfire management • Planting as required
High-Value Regrowth vegetation area (OMU 2)	Discontinuous canopy vegetation	• Assisted natural regeneration • Weed removal/control • Bushfire management • Planting as required
Non-remnant vegetation area (OMU 3)	Discontinuous canopy vegetation	• Reconstruction • Weed removal/control • Bushfire management



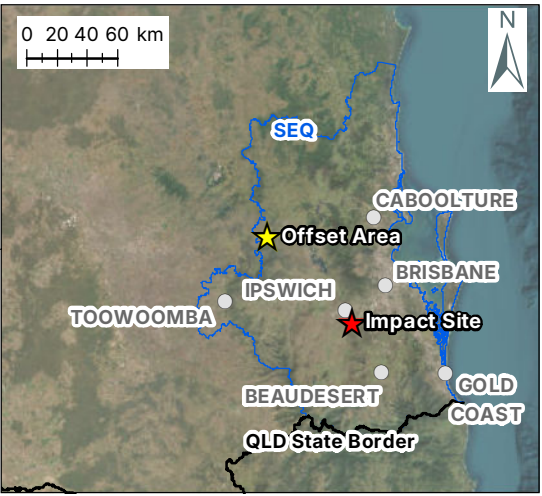
17. OFFSET AREA OPERATIONAL MANAGEMENT UNITS & REHABILITATION AREAS



Notes:
The information on this plan is not suitable for any purpose other than the expressed use of the Client. Property dimensions, areas, numbers of lots and contours and other physical features may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of Saunders Havill. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources
Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community
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Updated data available at
<http://qlds.patial.information.qld.gov.au/catalogue/>
* Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

- LEGEND**
- Qld DCDB
 - Offset Property
 - Offset Area
- Operational Management Units**
- Operational Management Unit 1:
Category X - Open paddock
[36.3 ha]
 - Operational Management Unit 2:
Category X - Regrowth vegetation
[50.5 ha]
 - Operational Management Unit 3:
Remnant vegetation
[14 ha]



9.7.3 Rehabilitation methodology

Following the resolution of site analysis and management areas as part of rehabilitation design, prioritising site works are to be considered. Prior to site works commencing, the site will be secured from degrading impacts such as grazing by stock, unauthorised access and rubbish. Some factors that will require immediate attention include:

- The presence of highly invasive weed species that disperse further prior to substantial site works commencing.
- The presence of weed species that have a long-term impact on ecological communities such as exotic and weed varieties of vines.
- Flammable materials (including weed thickets, grasses and vines).
- Damaging and easy access by 4WD, motorbikes, and pedestrians into core retained vegetation and ecological restoration areas. This will require installation of temporary fencing where appropriate.

Site works can be typically broken down into the following categories depending on the condition of the site prior to works commencing:

- Primary Works
- Follow-up Works
- Maintenance Works

Primary works

Primary works, or initial works, within the site or a section of the site will commonly involve a sequence of activities such as the control of groundcover weeds, woody weeds in the understorey and exotic vines prior to the control of weed trees. Primary work has the effect of creating a large degree of disturbance which will stimulate the germination of native and exotic species. Therefore, continuing works are to be scheduled shortly after the initial visit to allow for timely control of the newly regenerating weeds. Where present, highly invasive weeds are to be treated as a priority during primary work in order to avoid invasion of newly disturbed areas. Some weeds will need to be treated in steps e.g., where weeded areas are being used by nesting birds or where the staged removal of canopy weed trees is required. Techniques used during primary work commonly involve spot spray, cut-scrape paint, cut-paint, scrape-paint, roll-hang and over spraying (source: SEQERF).

Following completion of weed management, rehabilitation such as assisted natural regeneration, construction, and fabrication planting can occur in areas unaffected by weed management activities or areas where primary weed management activities have concluded. At the end of primary work, the zone will have been comprehensively and systematically worked, ready for follow-up works.

Follow-up works

At intervals, which will vary according to the type of weed impacting the site and growing conditions, follow-up work will be necessary. This generally involves the spot-spraying of newly germinating weeds and re-sprouting sections of woody weeds and vines. It is at this stage that observational visits will be made to the site to assess the progress of vegetation regeneration and determine whether follow-up work is necessary. A site that receives poorly-timed, too frequent, or too little follow-up will rapidly experience setbacks, as weed propagules will quickly become established in the newly disturbed areas.



Germinating native seedlings may be outcompeted by weeds or damaged by inexperienced operators thereby exhausting the seed bank. Unless adequate follow-up can be ensured when planning restoration works, there is little point in commencing primary work, as time and resources are consumed with no substantial gain achieved (source: SEQERF).

Maintenance works

By the maintenance stage, the vegetation community supports germination and establishment of native plant species and canopy formation. Weed density decreases as the native plants, which have been supported through restoration works, are able to out-compete the weed species. One of the fundamental principles of ecological restoration involves creating or re-establishing a self-sustaining ecosystem. Therefore, the underlying goal is that maintenance will progressively decrease. While this goal is not always possible due to factors such as the continual reintroduction of weed propagules to the site from adjoining properties, unfavourable seasons or significant weather events, persistent weed species, or global influences such as the enhanced greenhouse effect, it will always be strived for (source: SEQERF).

Maintenance works includes minor, ongoing weed management and infill planting depending on site conditions. All rehabilitation works are to be carried out by a suitably qualified bush regeneration contractor.

Plant identification skills

Both native and weed species need to be identified prior to primary weed removal works and ongoing throughout the follow-up and maintenance periods. This will maximise natural regeneration by reducing the likelihood of accidental weed spraying to native vegetation. Regenerating species are to be treated and maintained in a similar manner to planted tube stock. Where a contractor is unsure of species, advice will be sought from a botanist, specialist contractor, or confirmed with Queensland Herbarium. Refer to indicative Weed Treatment schedules derived from the *South East Queensland Ecological Restoration Framework: Manual* (2012) for an indication of weed species and treatments (refer **Table 55**).

Planting notes

Areas subjected to weed removal and control will require infill planting (assisted natural regeneration) where lack of natural regeneration is evident. Prior to installation, the following items will be considered:

- Species selection;
- Sourcing plant material;
- Timing of planting;
- Site preparation;
- Planting density; and
- Planting installation.

Species selection



Species selection is critical to achieving the desired ecological restoration outcomes for rehabilitation sites. Planting is typically derived from:

- Local and pre-clear Regional Ecosystem descriptions;
- Observed site native vegetation;
- Bioretention guideline requirements;
- Climatic and weather conditions observed on-site (frost, salt-spray, etc);
- 'Pioneer' species, which are useful in site stabilisation and encouraging native regeneration;
- The utilisation of flowering and fruiting species to attract wildlife and result in introduction of seeds;
- Diverse vegetation layers (trees, shrubs, groundcovers); and
- Species availability from seed propagation and or local nurseries.

Sourcing plant material

There are several options for sourcing plant material for infill planting purposes. Propagation from site seed is a good outcome but is often limited by the required timing of works. Sourcing plants from local nurseries is the more commonly chosen option and has the following benefits:

- Awareness of genetic considerations when collecting seed;
- Experience with breaking dormancy mechanisms in hard to germinate seeds;
- Highly successful propagation techniques;
- Ability to provide high quality stock to order; and
- Draw on industry resources.

Timing of planting

The timing of planting will ideally be aligned with the wet season in SEQ (Summer and Autumn). This minimises the need for intensive watering to establishment planting. Planting between February - May is the most beneficial as it generally avoids intense heat periods of summer. However, it is understood planting can occur at various times within rehabilitation areas due to development timing needs.

Site preparation

Site or planting preparation includes:

- Fencing to exclude grazing animals and people;
- Pre-spraying of exotic grasses and other weeds to planting areas;
- Consideration of source of water for new planting (access tracks, temporary irrigation);
- Arranging delivery of mulch, jute netting and tree guards where required;
- Treatment of heavily compacted soils by ripping and or application of gypsum; and
- Soil amelioration as required.



Planting density

Plant density is calculated on a zone-by-zone basis to cater for various requirements, including infill-only requirements such as canopy trees at low densities.

Planting installation

The following outlines the preferred installation methodology for revegetation works within the rehabilitation areas. It has been designed to maximise plant establishment success rates and minimise plant mortality. Revegetation works shall be either undertaken or directly supervised by an experienced and qualified contractor. All works shall be in accordance with the provisions of this Offset Management Framework, and local government policies and Australian Standards.

Plant installation methods shall include:

- Plants are to be vigorous, well established, hardened off, consistent with species or variety, free from disease and insect pests, with large root systems and no evidence of having been restricted or damaged. The landscape coordinator has the right to inspect and reject stock prior to planting.
- Plants are to be planted immediately after delivery to the planting site.
- Excavate planting medium to a depth suitable for the installation of tube or pot specimens. In areas where planting substrate is deemed to be very poor (compacted, nutrient deficient, hydrophobic etc.) and above areas of potential frequent inundation and waterflow, topsoil can be used.
- Pre-water plant hole if soil is dry to decrease root stress upon planting and assess the infiltration of water through the soil.
- Place plant into hole and backfill ensuring that the plant is upright and the stem is not covered in any less than 10 millimetres (mm) or any more than 20 mm of planting medium.
- Plants are to be watered thoroughly immediately after planting (ensure deep irrigation) and thereafter as required during the construction phase of the development depending on climatic conditions. Creation of a concave hollow around the base of each plant will aid water infiltration to the plant roots.
- A complete, long-term slow-release fertiliser such as Nutricote or similar will be administered appropriately during planting. Topdressing with slow-release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.

Regeneration monitoring

Once weed removal/control has been completed the engaged suitably qualified environmental consultant will be notified to monitor natural regeneration. Photo point monitoring and GPS locational and extent survey will be utilised.

The coordinates of the initial photo monitoring will be recorded using the handheld GPS which will assist in locating the monitoring point during subsequent monitoring periods. Photo point monitoring will be undertaken annually at the same time of the year post rehabilitation works.

The photos will provide the baseline imagery to compare future photo point monitoring and ensure the integrity of the fence. A record of the photos will be maintained which includes:



- GPS coordinates of the photo point.
- Date, time and number of each photo.
- Direction in which the photo was taken (north, south, east and west).
- After each photo monitoring event, a GPS waypoint of the location of the rehabilitation and a GPS polyline of the extent will be recorded.

If natural regeneration fails, infill planting will be implemented. Following infill planting, monitoring will commence in the same manner outlined above.

The following elements will be noted on a field datasheet:

- The presence of weeds within the extent.
- Natural regeneration of native species.

Where relevant:

- the planted stock (a physical count of alive plants in the ground).
- The average health of the planted stock.
- The average height of the planted stock.

9.7.4 Annual monitoring and reporting

Rehabilitation works progress reports will be prepared by the suitably qualified regeneration contractor and included in the OAAR.

The suitably qualified regeneration contractor will complete annual monitoring tasks until establishment of plantings is achieved (typically after five years):

Annual photo monitoring

To monitor Management Action 5, photo point monitoring and GPS locational and extent survey will be utilised. The coordinates of the initial photo monitoring will be recorded using the handheld GPS. Photo point monitoring will be undertaken annually at the same location and time of the year, before and after planting has commenced. If natural regeneration fails, infill planting will be implemented. Following infill planting, monitoring will commence.

The photos provide the baseline imagery to compare future photo point monitoring. A record of the photos will be maintained which includes:

- GPS coordinates of the photo point.
- Date, time and number of each photo.
- Direction in which the photo was taken (north, south, east and west).
- After each photo monitoring event, a GPS waypoint of the location of the rehabilitation and a GPS polyline of the extent will be recorded.



Rehabilitation and regeneration survey

The following elements will be noted on a field datasheet:

- The success of the rehabilitation stock (a physical count of alive plants in the ground).
- The average health of the rehabilitation stock.
- The average height of the rehabilitation stock.
- The presence of weeds within the rehabilitation extent.
- Natural regeneration of native species.

Infill planting records (where required)

The following elements will be noted on a field datasheet:

- The success of the rehabilitation stock (a physical count of alive plants in the ground).
- The average health of the rehabilitation stock.
- The average height of the rehabilitation stock.
- The presence of weeds within the rehabilitation extent.
- Natural regeneration of native species.

9.7.5 Milestone monitoring

The suitably qualified person as appointed by the Proponent will complete MHQA surveys before the end of Years 5, 10, 15, and 20 of the offset to assess against the interim milestones and environmental outcomes (see **Section 6** and **Table 49**).

This will include:

- MHQA transects at baseline sampling locations;
- Weed line transects; and
- Direct and indirect surveys to target Koala presence, including Spot Assessment Technique surveys, motion triggered camera trapping.

9.8. Management Action 6 – Fencing and Signage

The proposed offset area will be suitably fenced and marked with signage to discourage trespassing and keep out unmanaged cattle grazing. Gates leading to the subject proposed offset area will have signage installed for added protection.

Fencing and signage will be installed in Year 1. Fences will be monitored in their entirety on an ongoing basis as per daily site management. Damaged fences will be rectified within 2 weeks. Any internal fences that include barbed wire will also be retrofitted to further reduce threats to MNES.

Fauna friendly fencing is based on the following specifications:



- Top strand plain wire, and
- Bottom strand either plain wire, or barbed wire set at a minimum 300 mm above ground.

9.9. Reporting requirements

An OAAR will be prepared by the Offset Provider for each year of the offset detailing management activities undertaken in accordance with the Management Framework and providing clear details on how performance targets specified in **Table 48** are being addressed and any adaptive management measures implemented. The OAAR will be provided to the Proponent and suitably qualified person preparing the **Annual Compliance Report (ACR)** one (1) month after each annual anniversary of the date of legal securement of the offset area (i.e. if the site is legally secured on 1 July 2025, year one ACR will be due before 1 Augst 2026, year two before 1 August 2027, etc.).

A **Milestone Report** is proposed to be completed by a suitably qualified person appointed by the Proponent 3 months after the completion of milestone surveys of Years 5, 10, 15, and 20 of the offset detailing how the offset is progressing against the interim milestones, key performance indicators and environmental outcomes specified in **Section 7** and **Table 48**. This will include an assessment of whether each environmental outcome has been or is likely to be achieved and advise of any circumstance/s which they consider is/are affecting the achievement of each outcome. The findings of each assessment will be documented and published within 3 months of the end of the relevant year of the offset in which the assessment is undertaken.

An ACR will be prepared in line with any conditions associated with EPBC approval. The OAAR and Milestone Reports will be included as part of the Annual Compliance Reports. The reporting period for the action will be the year following the commencement of the action.

The ACR will be prepared by a qualified environmental person as directed by the Proponent and published on the project website each year by the conditioned date. The report will address the compliance with each of the conditions of approval, including any incident reports of undesirable impacts upon Koalas (including Koala habitat) and any monitoring and management milestones achieved during the previous 12 months, including progress on key management measures, attainment of performance targets and completion criteria, and adaptive implementation outcomes. The compliance report will also address the effectiveness of the management measures and how the proposed offset area is progressing against performance and completion criteria.

Documentary evidence providing proof of the date of publication of the ACR and non-compliance with any of the conditions of the approval will be provided to DCCEEW at the time of publishing the compliance report if the action is approved.

Section 8 provides a monitoring and reporting schedule for the OMP. This includes the management action, monitoring actions, corrective action trigger, corrective action, reporting action and responsible person/party.



9.10. Data Management

The Proponent, Offset Provider and engaged suitably qualified person appointed by the Proponent and/or Offset Provider will be responsible for the management of data, including interpretation, reporting and presentation. The Proponent will be responsible for the ownership, distribution and availability of data to the Department



10. Adaptive Management

An adaptive implementation program will be used to ensure uncertainty is reduced over time, and that completion criteria are attained and maintained for the life of the offset. As more information becomes available following ongoing performance monitoring, the management and monitoring regime will be reviewed and revised to maximise the likelihood of attaining and maintaining the outcomes to be achieved by implementing the OMP. Any updates to the OMP which do not result in a material change to the environmental outcomes, performance and completion criteria will be made by the Offset Provider without the requirement of approval from DCCEE (however a copy of OMP changes will be sent to DCCEE for record keeping). If material amendments likely to alter the environmental outcomes, or performance and completion criteria are proposed to the OMP, the amendments and justification for the contingency measures will be provided to DCCEE in writing.

Adaptive management will be used to incorporate changes in any of the following areas:

1. Assimilation of new data or information – such as, updates to conservation advice or new threat abatement plans relevant to the Koala.
2. Project coordination and scheduling – to manage unforeseen disruptions to schedule such as inclement weather on contractor works for management actions and environmental consultant monitoring events.
3. Annual review of risks – to refresh the mitigation measures new threats will be identified or stochastic events such as unplanned fires or floods that occur.
4. Annual review of management measure effectiveness – to increase the frequency or change the method of management actions where monitoring performance criteria are not met.
5. Contingency for unplanned incidents – such as stochastic events including unplanned fires or floods.

An audit of OMP completed every five (5) years with consideration to the areas identified above and will be directed by the Offset Provider and an appointed suitably qualified person by the proponent.

10.1. Uncertainty

The plan identifies and manages uncertainty. To this end the plan specifies:

- a) key data/information used to formulate the plan;
- b) the limitations and/or uncertainty associated with the use of that data/information;
- c) the risks that limitation and/or uncertainty represents for plan failure; and
- d) how limitations and/or uncertainty, and associated risks, are mitigated during plan implementation. For example, where a margin of safety is applied to management measures until uncertainty is reduced to an acceptable level or performance targets/completion criteria are attained/maintained.

To identify and manage uncertainty, the OMP used regulatory and policy context to formulate the plan, listed below.



10.1.1 Regulatory and policy context

This document has been prepared taking into account the following technical guidelines and legislation:

- National Recovery Plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE 2022)
- EPBC Act environmental offsets policy (Department of Sustainability, Environment, Water, Population and Communities, 2012);
- EPBC Act Environmental Management Plan Guidelines (DoEE, 2014)
- Policy Statement: Advanced environmental offsets under the *Environment Protection and Biodiversity Conservation Act 1999*;
- *Vegetation Management Act 1999* (legally securing the offset through a Voluntary Declaration under Section 19F);
- Queensland *Environmental Offsets Act 2014*; and
- Queensland *Environmental Offsets Regulation 2014*.

10.2. Risk of Failure

The plan assesses the risk of failure to achieve the plan's performance targets and/or completion criteria. To this end the plan:

- a) states the plan's performance targets and/or completion criteria;
- b) identifies events or circumstances that prejudice attainment/maintenance of performance targets and/or completion criteria. The events or circumstances must address scientific/ecological uncertainty, stochastic events and legal/land use planning factors that represent risks;
- c) includes a qualitative assessment of the likelihood and consequence of those events or circumstances, and the residual risk of failure to achieve those criteria due to identified events or circumstances (*assuming management measures will be implemented*);
- d) characterises risk as low, medium, high or severe, and derived from likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical); and
- e) outlines how consequence, likelihood and risk level for each risk have been determined.

To identify the risk of failure, **Table 57** states the management action, completion criteria, corrective action triggers and corrective actions. In addition, a risk assessment has been completed in **Appendix F**.



Table 57: Risk of failure table and corrective actions

Action	Completion Criteria	Corrective Action Trigger	Corrective Action
Legally secure the offset area	- The offset area is legally secured for conservation via a suitable method such as a VDEC process administered under the Queensland VMA prior to the impacts occurring and a permanent securing mechanism agreed with the Department. - The Department is notified of the legal securement within 5 business days of commencing the implementation of the OMP <i>i.e.</i>, the date from which the offset area is legally secured. - The offset area is not used for other purposes – site access is restricted.	Offset area is not legally secured.	The offset area is legally secured prior to any impacts occurring.
Non-Native Vertebrate Pest Management	Non-native vertebrate pests and evidence of pests are suppressed within the offset area.	Pest management is not implemented and/or evidence of predation on Koalas is observed. Monitoring actions and OAARs identify ongoing presence of predator pest species. Monitoring actions and OAARs detect an increase in non-native	Implement supplementary control measures, increase frequency of control events or other management actions as required by the suitably qualified pest contractor within 6 months of a monitoring event where non-native predator detection has not decreased from baseline.



Action	Completion Criteria	Corrective Action Trigger	Corrective Action
		predators from the previous survey or relative to the baseline. The reduction in the number of non-native predators, relative to the baseline results have not been maintained from the time that it is first achieved, for the remainder of the life of the offset.	Where there is evidence of non-native predator activity, a trapping or baiting program by a suitably qualified contractor will be conducted within 6 months of detection. Risk management, corrective actions and adaptive management are to be integrated as required throughout the offset management period in response to changes or natural events. If performance criteria are not achieved by the timeframes outlined, the corrective actions will continue until achieved, extending the management period.
WONS management	The management actions must maintain WONS weed cover below 5% of the offset area by the end of Year 10 and be maintained for the life of the offset (20 years).	Weed cover has increased relative to the previous monitoring event. The extent of weed cover has not been maintained as required to reach the environmental outcome as identified in the OAARs and Milestone Reports.	Weed control program to be expanded/adapted to improve outcomes within 6 months following a monitoring event where the weed extent has not been maintained. Risk management, corrective actions and adaptive management are to be integrated as required throughout the offset management



Action	Completion Criteria	Corrective Action Trigger	Corrective Action
			period in response to changes or natural events. If key milestones and performance criteria are not achieved by the timeframes outlined in Table 48 and Table 49, the corrective actions will continue until achieved, extending the management period.
Bushfire management	- Mitigated risk of high intensity fires in the offset area. - Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes.	Bushfire management measures not implemented and/or a high intensity bushfire impacts the offset area. Unexpected bushfire event and resurgence of weeds/decreased habitat.	Undertake audit to inspect impacts within 2 weeks following an event (if deemed safe). Following annual monitoring of fuel loads, implement actions as directed by the local authority including prescribed burning or other techniques undertaken in consultation with the Queensland Rural Fire Brigade to manage fuel loads within 6 months or as soon as appropriate (<i>i.e.</i>, consider weather conditions). Recovery actions including weed control and management and/or infill planting will be undertaken where necessary to ensure the habitat quality performance criteria are achieved within the



Action	Completion Criteria	Corrective Action Trigger	Corrective Action
			management period within 6 months following an audit if weather conditions are favourable.
			Risk management, corrective actions and adaptive management are to be integrated as required throughout the offset management period in response to changes or natural events.
Habitat creation and regeneration management	- Rehabilitated areas are established, regenerated and mapped as remnant vegetation under Queensland's VMA successor legislation by Year 20, which requires 70% of canopy height and 50% of cover according to the relevant Regional Ecosystem benchmark to be reached. - Site condition metrics for Koala improves in accordance with environmental outcomes (see Section 7).	Regeneration measures not implemented as proposed; site condition metrics do not improve according to proposed environmental outcomes. Habitat does not achieve performance criteria as identified in Milestone Reports within the management period, implement corrective actions.	Infill planting will be implemented where required within 12 months following MHQA survey intervals. Monitoring of infill planting to occur regularly after initial planting in accordance with watering schedules determined by the bush regeneration contractor and dependent on weather. Monitoring will be undertaken regularly by the Offset Provider or appointed suitably qualified regeneration contractor after planting in accordance with watering schedules (depending on rainfall) of infill planting and supplementary direct seeding, planting, weed control, fertilizer, amelioration or other management



Action	Completion Criteria	Corrective Action Trigger	Corrective Action
			actions will be implemented as required to enhance success rate and stimulate tree growth and establishment. Risk management, corrective actions and adaptive management are to be integrated as required throughout the offset management period in response to changes or natural events. The management period can be extended to ensure environmental outcomes are able to be achieved.
Fencing and Signage	- The risk of mortalities or injury to Koala is mitigated as a result of barbed-wire fencing. - Where stock breaches or unauthorised access is recorded, this is rectified within 2 weeks.	Fencing or signage not installed or retrofitted as proposed causing Koala injury, stock breaches, or other unauthorised access.	Fencing is repaired and alternative signage and fencing solutions are considered if needed.



10.3. Limitations

Although an adaptive management plan will be implemented across the offset area for life of the offset (20 years), potential limitations to achieving these include:

- Associated risks and uncertainty in predicting the occurrence and extent of natural disasters or extreme weather events, including drought and flooding.
- Uncertainty of the rate at which vegetation will re-establish.
- The ability of native fauna (*i.e.*, Koala) to recognise and utilise the site.
- Uncertainty of future predator occurrence and the effectiveness of the pest management measures.
- Coordinated approaches between local governments and the offset area holder to ensure effective implementation of management plans.

The implementation of adaptive management measures will ensure that identified limitations are avoided and/or the subsequent impacts are mitigated where possible. The promotion of suitable habitat on-site through implementing the various management actions, along with the continuous monitoring of abundance, will assist in species utilisation of the site.

Further, the regular review of this OMP, inclusive of the management actions and monitoring methodologies detailed within it, will assist in identifying areas requiring improvement, as well as identify methodology that has been successful. The success or required amendments to the management plans or works on-site will be assessed during the completion of the ACR as required under the EPBC Approval. To ensure progress towards environmental outcomes and completion criteria is assessed correctly the baseline surveys have been developed to be repeatable and provide the data required for comparison against the completion criteria. Surveys are to be repeated in the same manner and location throughout the management period to ensure a consistent approach and accurate representation of the conservation values within the proposed offset area.



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12. Appendices

Appendix A

Impact Area – MHQA Raw Data

Appendix B

Offset Area – Koala MHQA and GHFF Baseline Scoring

Appendix C

Offset Area – Raw Weed Mapping MHQA Transect Data

Appendix D

Offset Area – Baseline Raw SAT Data

Appendix E

Offset Assessment Guide Calculator Results and Uplift Tables

Appendix F

Risk Assessment



Appendix A

Impact Area – MHQA Raw Data



	RE12.9-10.2 Benchmark	Transect 1	Transect 3	Average of Transect(s)	% Benchmark	Score	
SITE CONDITION							
Recruitment of woody perennial species in EDL	100	60	40	50.00	50	3	
Native plant species richness - trees	6	8	6	7.00	116.67	5	
Native plant species richness - shrubs	7	6	4	5.00	71.43	2.5	
Native plant species richness - grasses	7	6	6	6.00	85.71	2.5	
Native plant species richness - forbs	13	5	7	6.00	46.15	2.5	
Tree canopy height (Canopy)*	21	16	16	16.00	76.19	5	
Tree canopy height (Sub-canopy)*	12	7	7	7.00	58.33	3	
				*Average tree canopy height		4	
Tree canopy cover (Canopy)**	64	32.1	64.8	48.45	75.70	5	
Tree canopy cover (Sub-canopy)**	20	17.7	20.7	19.20	96.00	5	
				**Average tree canopy cover		5	
Shrub canopy cover	6	4.1	13.1	8.60	143.33	5	
Native grass cover*	21	19	78	48.50	230.95	5	
Organic litter*	48	63	32	47.50	98.96	5	
Large trees (euc plus non-euc) (per ha)	38	12	6	9.00	23.68	5	
Coarse woody debris (per ha)	506	200	210	205.00	40.51	2	
Non-native plant cover	0	10	10	10.00	10.00	5	
Quality and availability of food and foraging habitat	NA			40	-	40	
Quality and availability of shelter	NA			40	-	40	
					Site Condition Score (/160)		131.50
					Overall Site Condition Score - out of 3		2.47
SITE CONTEXT							
Size of patch	10			10			10
Connectedness	5			4			4
Context	5			4			4
Ecological Corridors	6			0			0
Role of site location to species overall population in the state	5			5			5
Threats to the species	15			1			1
Species mobility capacity	10			4			4
					Site Context Score (/56)		28
					Overall Site Context Score - out of 3		1.50
SPECIES STOCKING RATE							
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70			40			40
					Species Stocking Rate Score (/70)		40.00
					Overall Species Stocking Rate Score - out of 4		2.29
Overall Assessment Unit Score							6.25

3
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2.5
2.5
2.5

4

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131.50

Species Stocking Rate (SSR)						
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5	10		
		No	Yes - adjacent	Yes - on site		
Species usage of the site (habitat type & evidenced usage)	Score	0	5	10	15	
		Not habitat	Dispersal	Foraging	Breeding	
Approximate density (per ha)	Score	0	10	20	30	
		0%	low	med	high	
Role/importance of species population on site*	Score (Total from supplementary table below)	0	5	10		15
		0	5 - 15	20 - 35		40 - 45
Total SRR score (out of 70)	40					
SRR Score (out of 4)	2.285714286					

10| Koala detected on site

15| Breeding / Foraging

10| SAT surveys showed low usage using the east coast (med-high) category

5| See below

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

0 Given the low usage and lack of evidence of breeding occurring on sit

5 Unknown but using the cautionary principle it is considered possible.

0 The site is highly unlikely to be necessary for maintaining genetic dive

0 The site is not near the limit of koalas range

Assessment Unit - Regional Ecosystem	AU 1 - Remnant RE12.9-10.2				
Site Reference	Transect 1	Transect 3	Average	AU Score	OUT OF (X/X)
	Raw Data	Raw Data	Score		
Vegetation Condition	Cat B	Cat B	20	20	20
Species Richness	7	5	6	10	20
Flower Score	0.3582	0.3489	0.3535	5	10
Timing of Biological Shortages	10	10	10	10	10
Quality of Foraging Habitat	4	4	4	10	20
Non-native Plant Cover	10%	10%	10%	10	20
Site Condition Score				65	X
MAX Site Condition Score				100	X
Site Condition Score - out of 4				2.60	X
Size of patch	Patch size is greater than 200ha	Patch size is greater than 200ha	10	10	10
Connectedness	15 active camps within 20km	15 active camps within 20km	10	10	10
Context	38%	38%	6	6	10
Ecological Corridors	Outside	Outside	0	0	10
Role of site location to species overall population in the state	>4 active level 3 camps	>4 active level 3 camps	10	10	10
Threats to the species	5	5	5	5	10
Site Context Score				41	X
MAX Site Context Score				60	X
Site Context Score - out of 3				2.05	X
GHFF Foraging Tree Density	390	340	365	4	10
Species Stocking Rate Score				4	X
MAX Species Stocking Rate Score				10	X
Species Stocking Rate Score - out of 3				1.20	X
Total				5.85	

Stem Density Scoring

RE12.9-10.2	Score
0-30	2
31-130	4
131-220	6
221-235	8
236-245	10
246-260	8
261-350	6
351-450	4
>450	2

Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)
		2.5	1.5	1.5	1.5	1.5	1.5	
T1								
<i>Acacia leiocalyx</i>	0.0							
<i>Alphitonia excelsa</i>	0.0							
<i>Angophora leiocarpa</i>	0.35			x			x	
<i>Corymbia citriodora</i>	0.65	x	x					1
<i>Corymbia intermedia</i>	0.86			x	x		x	1
<i>Corymbia tessellaris</i>	0.4			x	x		x	
<i>Eucalyptus crebra</i>	0.65	x	x					1
<i>Eucalyptus tereticornis</i>	0.63	x	x	x		x	x	1
<i>Jacksonia scoparia</i>	0.0							
<i>Lophostemon suaveolens</i>	0.4				x		x	
<i>Petalostigma pubescens</i>	0.0							
Average	0.3582	Yes	Yes	Yes	Yes	Yes	Yes	4
Total Species:	11							
GHFF Species:	7							
Important Species:	4							

Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)
		2.5	1.5	1.5	1.5	1.5	1.5	
T3								
<i>Acacia concurrens</i>	0.0							
<i>Acacia leiocalyx</i>	0.0							
<i>Alphitonia excelsa</i>	0.0							
<i>Angophora leiocarpa</i>	0.35			x			x	
<i>Corymbia citriodora</i>	0.65	x	x					1
<i>Corymbia intermedia</i>	0.86			x	x		x	1
<i>Eucalyptus crebra</i>	0.65	x	x					1
<i>Eucalyptus tereticornis</i>	0.63	x	x	x		x	x	1
<i>Jacksonia scoparia</i>	0.0							
Average	0.349	Yes	Yes	Yes	Yes	Yes	Yes	4
Total Species:	9							
GHFF Species:	5							
Important Species:	4							

Listed as a Significant Food Tree

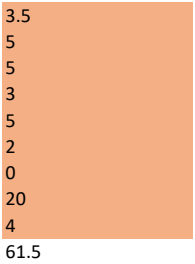
Listed under the recovery plan

Appendix B

Offset Area – Koala MHQA and GHFF Baseline Scoring



Assessment Unit - Regional Ecosystem	AU 1 - Cat X (Paddock) RE12.12.5					
	RE12.12.5 Benchmark	Transect 1	Transect 2	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	2	4	3	60.00	2.5
Native plant species richness - shrubs	9	3	3	3	33.33	2.5
Native plant species richness - grasses	11	2	3	2.5	22.73	0
Native plant species richness - forbs	17	1	5	3	17.65	0
Tree canopy height (Canopy)*	22	20	22	21	95.45	5
Tree canopy height (Sub-canopy)*	9	0	11	5.5	61.11	3
*Average tree canopy height						4
Tree canopy cover (Canopy)**	41	4.1	35.2	19.65	47.93	2
Tree canopy cover (Sub-canopy)**	10	0	29.5	14.75	147.50	5
**Average tree canopy cover						3.5
Shrub canopy cover	3	1.3	2.9	2.1	70.00	5
Native grass cover*	35	36	41	38.5	110.00	5
Organic litter*	35	2	14	8	22.86	3
Large trees (euc plus non-euc) (per ha)	29	4	2	3	10.34	5
Coarse woody debris (per ha)	578	0	202	101	17.47	2
Non-native plant cover	0	65	45	55	55.00	0
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	4	4	4	-	4
Site Condition Score (/160)						61.5
Overall Site Condition Score - out of 3						1.15
SITE CONTEXT						
Size of patch		0	0	0		0
Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						33
Overall Site Context Score - out of 3						1.77
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	30	30	30		30
Species Stocking Rate Score (/70)						30.00
Overall Species Stocking Rate Score - out of 4						1.71
Overall Assessment Unit Score						4.64



Species Stocking Rate (SSR)						
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5	10		
		No	Yes - adjacent	Yes - on site		
Species usage of the site (habitat type & evidenced usage)	Score	0	5	10	15	
		Not habitat	Dispersal	Foraging	Breeding	
Approximate density (per ha)	Score	0	10	20	30	
		0% low	med	high		
Role/importance of species population on site*	Score (Total from supplementary table below)	0	5	10		15
		0	5 - 15	20 - 35	40 - 45	
Total SRR score (out of 70)		30				
SRR Score (out of 4)	1.71	4285714				

10 SAT surveys detected k

5|Dispersal

10|SAT surveys showed low presence using the east coast (med-high) category

5 See below

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

0

Given the low usage and lack of evidence of breeding occurring on si

5

Unknown but using the precautionary principle it is considered possi

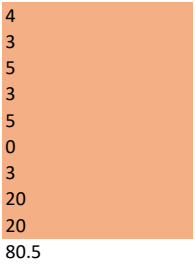
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The site is highly unlikely to be necessary for maintaining genetic div

0

The site is not near the limit of koalas range

Assessment Unit - Regional Ecosystem	AU 2 - Cat X (Vegetated) RE12.12.5					
	RE12.12.5 Benchmark	Transect 3	Transect 6	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	4	4	4	80.00	2.5
Native plant species richness - shrubs	9	7	4	5.5	61.11	2.5
Native plant species richness - grasses	11	3	2	2.5	22.73	0
Native plant species richness - forbs	17	5	8	6.5	38.24	2.5
Tree canopy height (Canopy)*	22	20	19	19.5	88.64	5
Tree canopy height (Sub-canopy)*	9	9	10	9.5	105.56	5
				*Average tree canopy height		5
Tree canopy cover (Canopy)**	41	31.3	40.3	35.8	87.32	5
Tree canopy cover (Sub-canopy)**	10	32.3	18.7	25.5	255.00	3
				**Average tree canopy cover		4
Shrub canopy cover	3	6.6	6.5	6.55	218.33	3
Native grass cover*	35	53	36	44.5	127.14	5
Organic litter*	35	13	15	14	40.00	3
Large trees (euc plus non-euc) (per ha)	29	6	4	5	17.24	5
Coarse woody debris (per ha)	578	59	0	29.5	5.10	0
Non-native plant cover	0	30	70	50	50.00	3
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	20	20	20	-	20
Site Condition Score (/160)						80.5
Overall Site Condition Score - out of 3						1.51
SITE CONTEXT						
Size of patch		10	10	10		10
Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						43
Overall Site Context Score - out of 3						2.30
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	40	40	40		40
Species Stocking Rate Score (/70)						40.00
Overall Species Stocking Rate Score - out of 4						2.29
Overall Assessment Unit Score						6.10



Species Stocking Rate (SSR)						
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5		10	
		No	Yes - adjacent		Yes - on site	
Species usage of the site (habitat type & evidenced usage)	Score	0	5	10	15	
		Not habitat	Dispersal	Foraging	Breeding	
Approximate density (per ha)	Score	0	10	20	30	
		0% low	med	high		
Role/importance of species population on site*	Score (Total from supplementary table below)	0	5	10		15
		0	5 - 15	20 - 35		40 - 45
Total SRR score (out of 70)		40				
SRR Score (out of 4)		2.285714286				

10 SAT surveys detected k

15 Foraging / Breeding

10 SAT surveys showed low presence using the east coast (med-high) category

5 See below

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

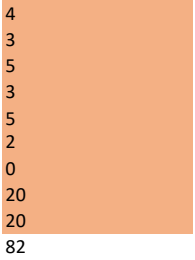
0 Given the low usage and lack of evidence of breeding occurring on si

5 Unknown but using the precautionary principle it is considered possi

0 The site is highly unlikely to be necessary for maintaining genetic div

0 The site is not near the limit of koalas range

Assessment Unit - Regional Ecosystem	AU3 - Cat B RE12.12.5					
	RE12.12.5 Benchmark	Transect 4	Transect 5	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	3	2	2.5	50.00	2.5
Native plant species richness - shrubs	9	5	7	6	66.67	2.5
Native plant species richness - grasses	11	3	3	3	27.27	2.5
Native plant species richness - forbs	17	6	12	9	52.94	2.5
Tree canopy height (Canopy)*	22	21	18	19.5	88.64	5
Tree canopy height (Sub-canopy)*	9	10	9	9.5	105.56	5
*Average tree canopy height						5
Tree canopy cover (Canopy)**	41	45.8	57.9	51.85	126.46	5
Tree canopy cover (Sub-canopy)**	10	22.2	20.1	21.15	211.50	3
**Average tree canopy cover						4
Shrub canopy cover	3	8.8	14.8	11.8	393.33	3
Native grass cover*	35	73	46	59.5	170.00	5
Organic litter*	35	1	10	5.5	15.71	3
Large trees (euc plus non-euc) (per ha)	29	4	8	6	20.69	5
Coarse woody debris (per ha)	578	52	116	84	14.53	2
Non-native plant cover	0	55	70	62.5	62.50	0
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	20	20	20	-	20
Site Condition Score (/160)						82
Overall Site Condition Score - out of 3						1.54
SITE CONTEXT						
Size of patch		10	10	10		10
Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						43
						2.30
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	40	40	40		40
Species Stocking Rate Score (/70)						40.00
Overall Species Stocking Rate Score - out of 4						2.29
Overall Assessment Unit Score						6.13



Species Stocking Rate (SSR)					
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score	0	5	10	
		No	Yes - adjacent	Yes - on site	
Species usage of the site (habitat type & evidenced usage)	Score	0	5	10	15
		Not habitat	Dispersal	Foraging	Breeding
Approximate density (per ha)	Score	0	10	20	30
		0%	low	med	high
Role/importance of species population on site*	Score (Total from supplementary table below)	0	5	10	15
		0	5 - 15	20 - 35	40 - 45
Total SRR score (out of 70)		40			
SRR Score (out of 4)		2.285714286			

10 SAT surveys detected k

15Foraging / Breeding

10SAT surveys showed low presence using the east coast (med-high) category

5See below

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

0Given the low usage and lack of evidence of breeding occurring on si

5Unknown but using the precautionary principle it is considered possi

0The site is highly unlikely to be necessary for maintaining genetic div

0The site is not near the limit of koalas range

Assessment Unit - Regional Ecosystem	AU 1 Non-remnant RE12.12.5 paddock				
Site Reference	Transect 1	Transect 2	Average Score	AU Score	OUT OF (X/X)
	Raw Data	Raw Data			
Vegetation Condition	5.0	5.0	5.00	5	20
Species Richness	2.0	4.0	3.00	5	20
Flower Score	0.755	0.640	0.6975	8	10
Timing of Biological Shortages	8.5	8.5	8.50	8.5	10
Quality of Foraging Habitat	2	3	2.50	5	20
Non-native Plant Cover	65.00	45.00	55.00	1	20
Site Condition Score				32.5	X
MAX Site Condition Score				100	X
Site Condition Score - out of 4				1.30	X
Size of patch	10	10	10	10	10
Connectedness	3	3	3	3	10
Context	6	6	6	6	10
Ecological Corridors	10	10	10	10	10
Role of site location to species overall population in the state	1	1	1	1	10
Threats to the species	5	5	5	5	10
Site Context Score				35	X
MAX Site Context Score				60	X
Site Context Score - out of 3				1.75	X
GHFF Foraging Tree Density - Recorded	5	47	26.00		
GHFF Foraging Tree Density - per hectare	25	235	130.00	4	10
Species Stocking Rate Score				4	X
MAX Species Stocking Rate Score				10	X
Species Stocking Rate Score - out of 3				1.20	X
Total				4.25	

5
5
8
8.5
5
1
32.5

Site Condition	
Vegetation Description	Score
Cat X	5
Cat C	10
Cat B	20

Canopy Species Richness	Score
0 GHFF Foraging Species	0
1 - 3 GHFF Foraging Species	5
4 - 6 GHFF Foraging Species	10
> 6 GHFF Foraging Species	20

Quality of Foraging Species	Score
0 Significant Foraging Species	0
1 - 3 Significant Foraging Species	5
4 - 6 Significant Foraging Species	10
> 6 Significant Foraging Species	20

Scores:	Flower Score	Timing of Shortages							Quality of Foraging	
	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating & conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)		8.5
		2.5	1.5	1.5	1.5	1.5	1.5			
T1										
<i>Corymbia citriodora</i>	0.65	x	x					1		
<i>Corymbia intermedia</i>	0.86			x	x		x	1		
Average	0.7550	Yes	Yes	Yes	Yes	No	Yes	2		
Total Species:	2									
GHFF Species:	2									
Important Species:	2									

Scores:	Flower Score	Timing of Shortages							Quality of Foraging	
	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating & conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)		8.5
		2.5	1.5	1.5	1.5	1.5	1.5			
T2										
<i>Corymbia citriodora</i>	0.65	x	x					1		
<i>Corymbia intermedia</i>	0.86			x	x		x	1		
<i>Corymbia tessellaris</i>	0.40			x	x		x			
<i>Eucalyptus crebra</i>	0.65	x	x					1		
Average	0.6400	Yes	Yes	Yes	Yes	No	Yes	3		
Total Species:	4									
GHFF Species:	4									
Important Species:	3									

Listed as a Significant Food Tree

Listed under the recovery plan

Site Context	
Size of Patch	
< 5 hectares	0
5-25 hectares	2
26-100 hectares	5
101-200 hectares	7
> 200 hectares	10

Connectedness	
Active GHFF camps within 20 km	
<1 camps	0
1 - 3 camps	3
4 - 6 camps	6
> 6 camps	10

Context	
% GHFF Foraging habitat within 20km	
<10%	0
10 - 30%	3
31 - 75%	6
> 75%	10

Site Context	
Size of patch	<200
Connectedness	1 active
Context	37%
Ecological Corridors	10
Role of site to species overall population	1-3 camps
Threats to the species	Moderate

Ecological Corridors	
Not within ecological corridor	0
Sharing a common boundary	6
Within an ecological corridor	10

Threats to species	
High level threat	1
Moderate Level Threat	5
Low Level Threat	10

Role of site location to overall population	
Active Lvl 3 GHFF Camp within 20km	
<1 camp	0
1 - 3 camps	6
> 3 camps	10

Species Stocking Rate		
Stem Density Scoring		
RE: 12.12.5	Density:	680
Score	Lower	Upper
2	0	85
4	86	368
6	369	623
8	624	666
10	667	694
8	695	737
6	738	992
4	993	1275
2	1276	

Assessment Unit - Regional Ecosystem	AU 2 Non-remnant RE12.12.5 vegetated				
Site Reference	Transect 3	Transect 6	Average Score	AU Score	OUT OF (X/X)
	Raw Data	Raw Data			
Vegetation Condition	5	5	5.00	5	20
Species Richness	3	3	3.00	5	20
Flower Score	0.6400	0.7200	0.6800	8	10
Timing of Biological Shortages	8.5	8.5	8.50	8.50	10
Quality of Foraging Habitat	3	3	3.00	5	20
Non-native Plant Cover	30.00	70.00	50.00	5	20
Site Condition Score				36.5	X
MAX Site Condition Score				100	X
Site Condition Score - out of 4				1.46	X
Size of patch	10	10	10	10	10
Connectedness	3	3	3	3	10
Context	6	6	6	6	10
Ecological Corridors	10	10	10	10	10
Role of site location to species overall population in the state	1	1	1	1	10
Threats to the species	5	5	5	5	10
Site Context Score				35	X
MAX Site Context Score				60	X
Site Context Score - out of 3				1.75	X
GHFF Foraging Tree Density - Recorded	80	44	62		
GHFF Foraging Tree Density - per hectare	400	220	310	4	10
Species Stocking Rate Score				4	X
MAX Species Stocking Rate Score				10	X
Species Stocking Rate Score - out of 3				1.20	X
Total				4.41	

5
5
8
8.5
5
5
36.5

Site Condition	
Vegetation Description	Score
Cat X	5
Cat C	10
Cat B	20
Canopy Species Richness	Score
0 GHFF Foraging Species	0
1 - 3 GHFF Foraging Species	5
4 - 6 GHFF Foraging Species	10
> 6 GHFF Foraging Species	20
Quality of Foraging Species	Score
0 Significant Foraging Species	0
1 - 3 Significant Foraging Species	5
4 - 6 Significant Foraging Species	10
> 6 Significant Foraging Species	20

Scores:	Flower Score	Timing of Shortages						Quality of Foraging	
Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)	
		2.5	1.5	1.5	1.5	1.5	1.5		8.5
T3									
<i>Corymbia citriodora</i>	0.65	x	x					1	
<i>Corymbia intermedia</i>	0.86			x	x		x	1	
<i>Corymbia tessellaris</i>	0.40			x	x		x		
<i>Eucalyptus crebra</i>	0.65	x	x					1	
Average	0.6400	Yes	Yes	Yes	Yes	No	Yes	3	
Total Species:	4								
GHFF Species:	3								
Important Species:	3								

Scores:	Flower Score	Timing of Shortages						Quality of Foraging	
Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)	
		2.5	1.5	1.5	1.5	1.5	1.5		8.5
T6									
<i>Corymbia citriodora</i>	0.65	x	x					1	
<i>Corymbia intermedia</i>	0.86			x	x		x	1	
<i>Corymbia erythrophloia</i>									
<i>Eucalyptus crebra</i>	0.65	x	x					1	
Average	0.7200	Yes	Yes	Yes	Yes	No	Yes	3	
Total Species:	4								
GHFF Species:	3								
Important Species:	3								

Site Context	
Size of Patch	
< 5 hectares	0
5-25 hectares	2
26-100 hectares	5
101-200 hectares	7
> 200 hectares	10
Connectedness	
Active GHFF camps within 20 km	
<1 camps	0
1 - 3 camps	3
4 - 6 camps	6
> 6 camps	10
Context	
% GHFF Foraging habitat within 20km	
<10%	0
10 - 30%	3
31 - 75%	6
> 75%	10

Site Context	
Size of patch	<200
Connectedness	1 active
Context	37%
Ecological Corridors	10
Role of site to species overall population	1-3 camps
Threats to the species	Moderate

Ecological Corridors	
Not within ecological corridor	0
Sharing a common boundary	6
Within an ecological corridor	10
Threats to species	
High level threat	1
Moderate Level Threat	5
Low Level Threat	10
Role of site location to overall population	
Active Lvl 3 GHFF Camp within 20km	
<1 camp	0
1 - 3 camps	6
> 3 camps	10

Species Stocking Rate		
Stem Density Scoring		
RE: 12.12.5	Density:	680
Score	Lower	Upper
2	0	85
4	86	368
6	369	623
8	624	666
10	667	694
8	695	737
6	738	992
4	993	1275
2	1276	

Assessment Unit - Regional Ecosystem	AU 3 Remnant RE12.12.5				
Site Reference	Transect 4	Transect 5	Average Score	AU Score	OUT OF (X/X)
	Raw Data	Raw Data			
Vegetation Condition	20	20	20.00	20	20
Species Richness	3	2	2.50	5	20
Flower Score	0.7200	0.4333	0.5767	8	10
Timing of Biological Shortages	8.50	4.00	6.25	6.25	10
Quality of Foraging Habitat	3	2	2.50	5	20
Non-native Plant Cover	55.00	70.00	62.50	1	20
Site Condition Score				45.25	X
MAX Site Condition Score				100	X
Site Condition Score - out of 4				1.81	X
Size of patch	10	10	10	10	10
Connectedness	3	3	3	3	10
Context	6	6	6	6	10
Ecological Corridors	10	10	10	10	10
Role of site location to species overall population in the state	1	1	1	1	10
Threats to the species	5	5	5	5	10
Site Context Score				35	X
MAX Site Context Score				60	X
Site Context Score - out of 3				1.75	X
GHFF Foraging Tree Density - Recorded	49	68	58.5		
GHFF Foraging Tree Density - per hectare	245	340	292.5	4	10
Species Stocking Rate Score				4	X
MAX Species Stocking Rate Score				10	X
Species Stocking Rate Score - out of 3				1.20	X
Total				4.76	

20
5
8
6.25
5
1
45.25

Site Condition	
Vegetation Description	Score
Cat X	5
Cat C	10
Cat B	20
Canopy Species Richness	Score
0 GHFF Foraging Species	0
1 - 3 GHFF Foraging Species	5
4 - 6 GHFF Foraging Species	10
> 6 GHFF Foraging Species	20
Quality of Foraging Species	Score
0 Significant Foraging Species	0
1 - 3 Significant Foraging Species	5
4 - 6 Significant Foraging Species	10
> 6 Significant Foraging Species	20

Scores:	Flower Score	Timing of Shortages						Quality of Foraging	
Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)	
		2.5	1.5	1.5	1.5	1.5	1.5		8.5
T4									
<i>Corymbia citriodora</i>	0.65	x	x					1	
<i>Corymbia intermedia</i>	0.86			x	x		x	1	
<i>Eucalyptus crebra</i>	0.65	x	x					1	
Average	0.7200	Yes	Yes	Yes	Yes	No	Yes	3	
Total Species:	3								
GHFF Species:	3								
Important Species:	3								

Scores:	Flower Score	Timing of Shortages						Quality of Foraging	
Flower Scores	Wt p*r	Food shortages Jul-Sep	Pregnancy Jul-Nov	Lactation Oct-Mar	Mating and conception Dec-May	Migration paths All year	Fruit industries Aug-Mar	Quality of foraging habitat (1 = Wt p*r ≥0.65)	
		2.5	1.5	1.5	1.5	1.5	1.5		4
T5									
<i>Corymbia citriodora</i>	0.65	x	x					1	
<i>Eucalyptus crebra</i>	0.65	x	x					1	
Average	0.4333	Yes	Yes	No	No	No	No	2	
Total Species:	2								
GHFF Species:	2								
Important Species:	2								

Site Context	
Size of Patch	
< 5 hectares	0
5-25 hectares	2
26-100 hectares	5
101-200 hectares	7
> 200 hectares	10
Connectedness	
Active GHFF camps within 20 km	
<1 camps	0
1 - 3 camps	3
4 - 6 camps	6
> 6 camps	10
Context	
% GHFF Foraging habitat within 20km	
<10%	0
10 - 30%	3
31 - 75%	6
> 75%	10

Site Context	
Size of patch	<200
Connectedness	1 active
Context	37%
Ecological Corridors	10
Role of site to species overall population	1-3 camps
Threats to the species	Moderate

Ecological Corridors	
Not within ecological corridor	0
Sharing a common boundary	6
Within an ecological corridor	10
Threats to species	
High level threat	1
Moderate Level Threat	5
Low Level Threat	10
Role of site location to overall population	
Active Lvl 3 GHFF Camp within 20km	
<1 camp	0
1 - 3 camps	6
> 3 camps	10

Species Stocking Rate		
Stem Density Scoring		
RE: 12.12.5	Density per ha:	680
Score	Lower value	Upper Value
2	0	85
4	86	368
6	369	623
8	624	666
10	667	694
8	695	737
6	738	992
4	993	1275
2	1276	

Appendix C

Offset Area – Raw Weed Mapping MHQA Transect Data



Transect 1 – Weed Cover

Start	End	Interval (m)	Dominant Species Coverage
0.00	1.20	1.20	<i>Heteropogon contortus</i>
1.20	4.90	3.70	<i>Bare Ground</i>
4.90	5.60	0.70	<i>Heteropogon contortus</i>
5.60	6.10	0.50	<i>Bare Ground</i>
6.10	10.40	4.30	<i>Lantana camara</i>
10.40	11.00	0.60	<i>Heteropogon contortus</i>
11.00	15.10	4.10	<i>Lantana camara</i>
15.10	16.30	1.20	<i>Heteropogon contortus</i>
16.30	17.90	1.60	<i>Lantana camara</i>
17.90	24.70	6.80	<i>Heteropogon contortus</i>
24.70	25.20	0.50	<i>Dodonaea viscosa</i>
25.20	33.80	8.60	<i>Heteropogon contortus</i>
33.80	39.60	5.80	<i>Bare Ground</i>
39.60	49.50	9.90	<i>Lantana camara</i>
49.50	51.30	1.80	<i>Bare Ground</i>
51.30	52.20	0.90	<i>Dianella caerulea</i>
52.20	53.90	1.70	<i>Bare Ground</i>
53.90	82.00	28.10	<i>Lantana camara</i>
82.00	84.60	2.60	<i>Bare Ground</i>
84.60	100.00	15.40	<i>Lantana camara</i>
Total	100		
Native species (%)			20.5
Non-native species (%)			63.4
Bare Ground (%)			16.1



Transect 2 – Weed Cover

Start	End	Interval (m)	Dominant Species Coverage
0.00	0.70	0.70	<i>Heteropogon contortus</i>
0.70	1.30	0.60	<i>Heliotropium amplexicaule</i>
1.30	2.80	1.50	Bare Ground
2.80	3.00	0.20	<i>Gomphocarpus physocarpus</i>
3.00	4.30	1.30	<i>Hydrocotyle acutiloba</i>
4.30	4.80	0.50	Bare Ground
4.80	5.70	0.90	<i>Heliotropium amplexicaule</i>
5.70	7.60	1.90	Bare Ground
7.60	8.00	0.40	<i>Gomphocarpus physocarpus</i>
8.00	8.50	0.50	<i>Hydrocotyle acutiloba</i>
8.50	9.20	0.70	Bare Ground
9.20	9.80	0.60	<i>Heliotropium amplexicaule</i>
9.80	10.70	0.90	Bare Ground
10.70	11.00	0.30	<i>Gomphocarpus physocarpus</i>
11.00	12.30	1.30	<i>Bidens pilosa</i>
12.30	13.00	0.70	Bare Ground
13.00	13.40	0.40	<i>Gomphocarpus physocarpus</i>
13.40	13.70	0.30	<i>Heliotropium amplexicaule</i>
13.70	15.80	2.10	<i>Hydrocotyle acutiloba</i>
15.80	16.70	0.90	<i>Heteropogon contortus</i>
16.70	18.80	2.10	<i>Hydrocotyle acutiloba</i>
18.80	21.00	2.20	<i>Crassocephalum crepidioides</i>
21.00	22.70	1.70	<i>Heteropogon contortus</i>
22.70	23.30	0.60	<i>Sida cordifolia</i>
23.30	27.00	3.70	<i>Heteropogon contortus</i>
27.00	27.50	0.50	<i>Verbena bonariensis</i>
27.50	28.50	1.00	<i>Cirisium vulgare</i>
28.50	29.50	1.00	<i>Heteropogon contortus</i>
29.50	31.10	1.60	<i>Hydrocotyle acutiloba</i>
31.10	32.60	1.50	<i>Heteropogon contortus</i>
32.60	33.50	0.90	<i>Hydrocotyle acutiloba</i>
33.50	35.20	1.70	<i>Heteropogon contortus</i>
35.20	36.30	1.10	<i>Hydrocotyle acutiloba</i>
36.30	38.60	2.30	<i>Heteropogon contortus</i>
38.60	40.20	1.60	<i>Hydrocotyle acutiloba</i>



Start	End	Interval (m)	Dominant Species Coverage
40.20	41.80	1.60	<i>Heteropogon contortus</i>
41.80	47.90	6.10	<i>Lantana camara</i>
47.90	48.40	0.50	<i>Cirisium vulgare</i>
48.40	49.20	0.80	<i>Heliotropium amplexicaule</i>
49.20	52.30	3.10	<i>Heteropogon contortus</i>
52.30	52.90	0.60	<i>Heliotropium amplexicaule</i>
52.90	53.80	0.90	<i>Hydrocotyle acutiloba</i>
53.80	54.30	0.50	<i>Heteropogon contortus</i>
54.30	56.30	2.00	<i>Hydrocotyle acutiloba</i>
56.30	58.30	2.00	<i>Heteropogon contortus</i>
58.30	59.30	1.00	<i>Cynodon dactylon</i>
59.30	60.30	1.00	<i>Heteropogon contortus</i>
60.30	62.10	1.80	<i>Hydrocotyle acutiloba</i>
62.10	63.60	1.50	<i>Heteropogon contortus</i>
63.60	65.00	1.40	<i>Cirisium vulgare</i>
65.00	66.50	1.50	<i>Heteropogon contortus</i>
66.50	67.10	0.60	<i>Hydrocotyle acutiloba</i>
67.10	69.60	2.50	Bare Ground
69.60	71.00	1.40	<i>Hydrocotyle acutiloba</i>
71.00	74.20	3.20	Bare Ground
74.20	75.60	1.40	<i>Heteropogon contortus</i>
75.60	76.50	0.90	<i>Hydrocotyle acutiloba</i>
76.50	77.40	0.90	Bare Ground
77.40	77.60	0.20	<i>Gomphocarpus physocarpus</i>
77.60	79.10	1.50	<i>Cynodon dactylon</i>
79.10	80.70	1.60	<i>Lantana camara</i>
80.70	87.60	6.90	Bare Ground
87.60	88.90	1.30	<i>Lantana camara</i>
88.90	98.80	9.90	Bare Ground
98.80	100.00	1.20	<i>Lantana camara</i>
Total	100		
Native species (%)			28.6
Non-native species (%)			41.8
Bare Ground (%)			29.6



Transect 3 – Weed Cover

Start	End	Interval (m)	Dominant Species Coverage
0.00	0.40	0.40	<i>Heteropogon contortus</i>
0.40	1.00	0.60	Bare Ground
1.00	1.50	0.50	<i>Heteropogon contortus</i>
1.50	2.30	0.80	Bare Ground
2.30	3.90	1.60	<i>Heteropogon contortus</i>
3.90	5.70	1.80	Bare Ground
5.70	8.20	2.50	<i>Lantana camara</i>
8.20	13.50	5.30	Bare Ground
13.50	14.10	0.60	<i>Heteropogon contortus</i>
14.10	15.00	0.90	Bare Ground
15.00	18.00	3.00	<i>Heteropogon contortus</i>
18.00	18.80	0.80	<i>Lantana montevidensis</i>
18.80	20.60	1.80	Bare Ground
20.60	26.70	6.10	<i>Heteropogon contortus</i>
26.70	28.20	1.50	Bare Ground
28.20	34.00	5.80	<i>Lantana camara</i>
34.00	40.40	6.40	<i>Heteropogon contortus</i>
40.40	49.50	9.10	<i>Lantana camara</i>
49.50	52.20	2.70	Bare Ground
52.20	78.60	26.40	<i>Lantana camara</i>
78.60	81.20	2.60	Bare Ground
81.20	81.60	0.40	<i>Lantana camara</i>
81.60	82.30	0.70	Bare Ground
82.30	96.40	14.10	<i>Heteropogon contortus</i>
96.40	96.60	0.20	<i>Chrysocephalum apiculatum</i>
96.60	96.90	0.30	<i>Lomandra multiflora</i>
96.90	100.00	3.10	<i>Heteropogon contortus</i>
Total	100		
Native species (%)			36.3
Non-native species (%)			45.0
Bare Ground (%)			18.7



Transect 4 – Weed Coverage

Start	End	Interval (m)	Dominant Species Coverage
0.00	5.10	5.10	<i>Lantana camara</i>
5.10	5.90	0.80	<i>Heteropogon contortus</i>
5.90	6.20	0.30	<i>Chrysocephalum apiculatum</i>
6.20	7.70	1.50	<i>Heteropogon contortus</i>
7.70	7.80	0.10	<i>Gomphocarpus physocarpus</i>
7.80	8.50	0.70	<i>Heteropogon contortus</i>
8.50	8.90	0.40	<i>Hydrocotyle acutiloba</i>
8.90	9.10	0.20	<i>Gomphocarpus physocarpus</i>
9.10	10.10	1.00	<i>Heteropogon contortus</i>
10.10	10.80	0.70	<i>Chrysocephalum apiculatum</i>
10.80	12.40	1.60	<i>Heteropogon contortus</i>
12.40	13.20	0.80	<i>Heliotropium amplexicaule</i>
13.20	14.20	1.00	<i>Heteropogon contortus</i>
14.20	14.90	0.70	<i>Chrysocephalum apiculatum</i>
14.90	17.80	2.90	<i>Aristida stricta</i>
17.80	18.80	1.00	<i>Chrysocephalum apiculatum</i>
18.80	20.40	1.60	<i>Aristida stricta</i>
20.40	21.30	0.90	<i>Heliotropium amplexicaule</i>
21.30	26.10	4.80	<i>Aristida stricta</i>
26.10	27.20	1.10	<i>Adiantum atroviride</i>
27.20	27.90	0.70	<i>Heteropogon contortus</i>
27.90	28.30	0.40	<i>Adiantum atroviride</i>
28.30	33.00	4.70	<i>Heteropogon contortus</i>
33.00	33.80	0.80	<i>Gomphocarpus physocarpus</i>
33.80	36.00	2.20	<i>Lantana camara</i>
36.00	37.10	1.10	<i>Bare Ground</i>
37.10	38.80	1.70	<i>Heteropogon contortus</i>
38.80	40.00	1.20	<i>Xanthorrhoea johnsonii</i>
40.00	42.50	2.50	<i>Melinis repens</i>
42.50	63.60	21.10	<i>Lantana camara</i>
63.60	72.50	8.90	<i>Heteropogon contortus</i>
72.50	74.10	1.60	<i>Chrysocephalum apiculatum</i>
74.10	75.50	1.40	<i>Heteropogon contortus</i>
75.50	79.20	3.70	<i>Melinis repens</i>
79.20	81.70	2.50	<i>Lantana camara</i>



Start	End	Interval (m)	Dominant Species Coverage
81.70	89.30	7.60	<i>Heteropogon contortus</i>
89.30	90.30	1.00	<i>Bare Ground</i>
90.30	94.30	4.00	<i>Heteropogon contortus</i>
94.30	94.70	0.40	<i>Gomphocarpus physocarpus</i>
94.70	96.40	1.70	<i>Heteropogon contortus</i>
96.40	96.70	0.30	<i>Gomphocarpus physocarpus</i>
96.70	100.00	3.30	<i>Heteropogon contortus</i>
Total	100		
Native species (%)			56.9
Non-native species (%)			41.0
Bare Ground (%)			2.10



Transect 5 – Weed Coverage

Start	End	Interval (m)	Dominant Species Coverage
0.00	1.10	1.10	<i>Heteropogon contortus</i>
1.10	2.20	1.10	<i>Heliotropium amplexicaule</i>
2.20	3.10	0.90	<i>Heteropogon contortus</i>
3.10	4.10	1.00	<i>Heliotropium amplexicaule</i>
4.10	4.80	0.70	<i>Heteropogon contortus</i>
4.80	6.50	1.70	<i>Cynodon dactylon</i>
6.50	7.60	1.10	<i>Heliotropium amplexicaule</i>
7.60	9.50	1.90	<i>Heteropogon contortus</i>
9.50	10.20	0.70	<i>Gomphocarpus physocarpus</i>
10.20	10.90	0.70	<i>Heteropogon contortus</i>
10.90	11.40	0.50	<i>Cyprus gracilis</i>
11.40	13.50	2.10	<i>Heteropogon contortus</i>
13.50	14.10	0.60	<i>Hydrocotyle acutiloba</i>
14.10	18.10	4.00	<i>Heteropogon contortus</i>
18.10	19.00	0.90	Bare Ground
19.00	20.30	1.30	<i>Hydrocotyle acutiloba</i>
20.30	21.10	0.80	Bare Ground
21.10	21.80	0.70	<i>Sida rhombifolia</i>
21.80	22.40	0.60	<i>Hydrocotyle acutiloba</i>
22.40	22.80	0.40	<i>Gomphocarpus physocarpus</i>
22.80	24.10	1.30	<i>Hydrocotyle acutiloba</i>
24.10	24.60	0.50	<i>Gomphocarpus physocarpus</i>
24.60	25.10	0.50	<i>Cyprus gracilis</i>
25.10	26.00	0.90	<i>Heliotropium amplexicaule</i>
26.00	31.80	5.80	<i>Heteropogon contortus</i>
31.80	34.10	2.30	<i>Hydrocotyle acutiloba</i>
34.10	37.50	3.40	<i>Lantana camara</i>
37.50	38.00	0.50	<i>Gomphocarpus physocarpus</i>
38.00	41.70	3.70	<i>Cyprus gracilis</i>
41.70	41.80	0.10	<i>Gomphocarpus physocarpus</i>
41.80	42.10	0.30	<i>Hydrocotyle acutiloba</i>
42.10	42.50	0.40	<i>Cirsium vulgare</i>
42.50	43.50	1.00	<i>Heteropogon contortus</i>
43.50	44.20	0.70	<i>Hydrocotyle acutiloba</i>
44.20	45.10	0.90	<i>Heteropogon contortus</i>



Start	End	Interval (m)	Dominant Species Coverage
45.10	45.40	0.30	<i>Cirsium vulgare</i>
45.40	48.30	2.90	<i>Heteropogon contortus</i>
48.30	48.90	0.60	<i>Gomphocarpus physocarpus</i>
48.90	51.40	2.50	<i>Heteropogon contortus</i>
51.40	51.60	0.20	<i>Cirsium vulgare</i>
51.60	53.40	1.80	<i>Gomphocarpus physocarpus</i>
53.40	53.90	0.50	<i>Cirsium vulgare</i>
53.90	62.00	8.10	<i>Heteropogon contortus</i>
62.00	63.20	1.20	<i>Heliotropium amplexicaule</i>
63.20	67.80	4.60	<i>Heteropogon contortus</i>
67.80	68.00	0.20	<i>Gomphocarpus physocarpus</i>
68.00	73.90	5.90	<i>Heteropogon contortus</i>
73.90	74.00	0.10	<i>Gomphocarpus physocarpus</i>
74.00	74.70	0.70	<i>Lomandra multiflora</i>
74.70	81.70	7.00	<i>Cynodon dactylon</i>
81.70	81.90	0.20	<i>Chrysocephalum apiculatum</i>
81.90	83.40	1.50	<i>Cynodon dactylon</i>
83.40	83.50	0.10	<i>Chrysocephalum apiculatum</i>
83.50	87.90	4.40	Bare Ground
87.90	88.50	0.60	<i>Chrysocephalum apiculatum</i>
88.50	90.20	1.70	<i>Cynodon dactylon</i>
90.20	91.20	1.00	<i>Heteropogon contortus</i>
91.20	94.00	2.80	<i>Cynodon dactylon</i>
94.00	95.60	1.60	<i>Lantana montevidensis</i>
95.60	97.40	1.80	<i>Melinis repens</i>
97.40	97.90	0.50	<i>Lantana montevidensis</i>
97.90	98.60	0.70	<i>Cynodon dactylon</i>
98.60	98.80	0.20	<i>Lantana montevidensis</i>
98.80	100.00	1.20	<i>Cynodon dactylon</i>
Total	100		
Native species (%)			62.3
Non-native species (%)			31.6
Bare Ground (%)			6.1



Transect 6 – Weed Coverage

Start	End	Interval (m)	Dominant Species Coverage
0.00	2.30	2.30	<i>Lantana camara</i>
2.30	4.10	1.80	<i>Gomphocarpus physocarpus</i>
4.10	4.30	0.20	<i>Cirsium vulgare</i>
4.30	5.40	1.10	<i>Gomphocarpus physocarpus</i>
5.40	5.90	0.50	<i>Heliotropium amplexicaule</i>
5.90	6.50	0.60	Bare Ground
6.50	7.00	0.50	<i>Gomphocarpus physocarpus</i>
7.00	8.20	1.20	Bare Ground
8.20	8.60	0.40	<i>Gomphocarpus physocarpus</i>
8.60	8.90	0.30	<i>Heliotropium amplexicaule</i>
8.90	9.30	0.40	<i>Gomphocarpus physocarpus</i>
9.30	10.50	1.20	<i>Argemone mexicana</i>
10.50	12.00	1.50	<i>Cirsium vulgare</i>
12.00	15.20	3.20	<i>Chrysocephalum apiculatum</i>
15.20	21.50	6.30	<i>Lantana camara</i>
21.50	25.30	3.80	<i>Cynodon dactylon</i>
25.30	27.00	1.70	<i>Lantana camara</i>
27.00	28.10	1.10	<i>Cynodon dactylon</i>
28.10	28.90	0.80	<i>Melinis repens</i>
28.90	29.70	0.80	<i>Cynodon dactylon</i>
29.70	31.80	2.10	<i>Sporobolus africanus</i>
31.80	32.80	1.00	<i>Melinis repens</i>
32.80	33.70	0.90	<i>Lantana camara</i>
33.70	35.60	1.90	<i>Heteropogon contortus</i>
35.60	39.10	3.50	<i>Lantana camara</i>
39.10	42.30	3.20	<i>Melinis repens</i>
42.30	44.60	2.30	<i>Lantana camara</i>
44.60	45.10	0.50	<i>Heteropogon contortus</i>
45.10	58.00	12.90	<i>Lantana camara</i>
58.00	59.80	1.80	<i>Chrysocephalum apiculatum</i>
59.80	61.80	2.00	<i>Lantana camara</i>
61.80	62.70	0.90	<i>Heteropogon contortus</i>
62.70	64.50	1.80	<i>Chrysocephalum apiculatum</i>
64.50	71.60	7.10	<i>Lantana camara</i>
71.60	73.90	2.30	<i>Melinis repens</i>



Start	End	Interval (m)	Dominant Species Coverage
73.90	74.00	0.10	<i>Gomphocarpus physocarpus</i>
74.00	75.40	1.40	<i>Melinis repens</i>
75.40	79.40	4.00	<i>Lantana camara</i>
79.40	82.70	3.30	<i>Stenotaphrum secundatum</i>
82.70	83.00	0.30	<i>Crassocephalum crepidioides</i>
83.00	86.00	3.00	<i>Stenotaphrum secundatum</i>
86.00	100.00	14.00	<i>Lantana camara</i>
Total	100		
Native species (%)			15.8
Non-native species (%)			82.4
Bare Ground (%)			1.8



Appendix D

Offset Area – Baseline Raw SAT Data



Spot Assessment Technique (SAT) Survey				
Date: 26.08.25		SAT ID: 2 (MHQA Transect 2)		
Tree No.	Scientific Name	Common Name	DBH	Scat present?
1	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	160	No
2	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	Yes
3	<i>Corymbia intermedia</i>	Pink Bloodwood	280	No
4	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	210	Yes
5	<i>Corymbia citriodora</i>	Spotted Gum	350	No
6	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	140	No
7	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	170	No
8	<i>Corymbia intermedia</i>	Pink Bloodwood	180	No
9	<i>Corymbia intermedia</i>	Pink Bloodwood	170	No
10	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	200	No
11	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	280	No
12	<i>Corymbia intermedia</i>	Pink Bloodwood	180	No
13	<i>Corymbia intermedia</i>	Pink Bloodwood	200	No
14	<i>Corymbia intermedia</i>	Pink Bloodwood	220	No
15	<i>Corymbia intermedia</i>	Pink Bloodwood	170	No
16	<i>Corymbia intermedia</i>	Pink Bloodwood	250	Yes
17	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	170	No
18	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	200	No
19	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	230	No
20	<i>Corymbia citriodora</i>	Spotted Gum	180	No
21	<i>Corymbia citriodora</i>	Spotted Gum	300	Yes
22	<i>Corymbia citriodora</i>	Spotted Gum	180	No
23	<i>Corymbia citriodora</i>	Spotted Gum	290	Yes
24	<i>Corymbia citriodora</i>	Spotted Gum	140	No
25	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
26	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	100	No
27	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	160	No
28	<i>Corymbia tessellaris</i>	Moreton Bay Ash	220	No
29	<i>Corymbia citriodora</i>	Spotted Gum	250	No
30	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
Total scats (/30)				4
Percentage				13
East Coast (med-high) Activity Category				Low



Spot Assessment Technique (SAT) Survey				
Date: 27.08.25		SAT ID: 3 (MHQA Transect 3)		
Tree No.	Scientific Name	Common Name	DBH	Scat present?
1	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	210	No
2	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	220	No
3	<i>Corymbia intermedia</i>	Pink Bloodwood	160	Yes
4	<i>Corymbia intermedia</i>	Pink Bloodwood	230	No
5	<i>Corymbia citriodora</i>	Pink Bloodwood	300	No
6	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	Yes
7	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	140	No
8	<i>Corymbia intermedia</i>	Pink Bloodwood	120	No
9	<i>Corymbia citriodora</i>	Spotted Gum	150	No
10	<i>Corymbia citriodora</i>	Spotted Gum	140	No
11	<i>Corymbia citriodora</i>	Spotted Gum	100	No
12	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	410	Yes
13	<i>Corymbia citriodora</i>	Spotted Gum	460	Yes
14	<i>Corymbia citriodora</i>	Spotted Gum	270	No
15	<i>Corymbia intermedia</i>	Pink Bloodwood	100	No
16	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
17	<i>Corymbia citriodora</i>	Spotted Gum	230	No
18	<i>Corymbia intermedia</i>	Pink Bloodwood	240	No
19	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	230	No
20	<i>Corymbia citriodora</i>	Spotted Gum	150	No
21	<i>Corymbia citriodora</i>	Spotted Gum	400	No
22	<i>Corymbia intermedia</i>	Pink Bloodwood	190	No
23	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	230	No
24	<i>Corymbia citriodora</i>	Spotted Gum	390	No
25	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	240	No
26	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
27	<i>Corymbia intermedia</i>	Pink Bloodwood	140	No
28	<i>Corymbia intermedia</i>	Pink Bloodwood	180	No
29	<i>Corymbia intermedia</i>	Pink Bloodwood	200	No
30	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	420	No
Total scats (/30)				4/30
Percentage				13
East Coast (med-high) Activity Category				Low



Spot Assessment Technique (SAT) Survey				
Date: 27.08.25		SAT ID: 4 (MHQA Transect 4)		
Tree No.	Scientific Name	Common Name	DBH	Scat present?
1	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	410	No
2	<i>Corymbia citriodora</i>	Spotted Gum	400	No
3	<i>Corymbia citriodora</i>	Spotted Gum	130	No
4	<i>Corymbia citriodora</i>	Spotted Gum	140	No
5	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	130	No
6	<i>Corymbia citriodora</i>	Spotted Gum	320	No
7	<i>Corymbia citriodora</i>	Spotted Gum	380	No
8	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
9	<i>Corymbia citriodora</i>	Spotted Gum	360	No
10	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	300	No
11	<i>Corymbia citriodora</i>	Spotted Gum	390	No
12	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	360	No
13	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	280	Yes
14	<i>Corymbia citriodora</i>	Spotted Gum	130	No
15	<i>Corymbia citriodora</i>	Spotted Gum	210	No
16	<i>Corymbia citriodora</i>	Spotted Gum	270	No
17	<i>Corymbia citriodora</i>	Spotted Gum	190	No
18	<i>Corymbia citriodora</i>	Spotted Gum	160	No
19	<i>Corymbia citriodora</i>	Spotted Gum	210	No
20	<i>Corymbia citriodora</i>	Spotted Gum	170	No
21	<i>Corymbia citriodora</i>	Spotted Gum	180	No
22	<i>Corymbia citriodora</i>	Spotted Gum	180	No
23	<i>Corymbia citriodora</i>	Spotted Gum	200	No
24	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	120	No
25	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	100	No
26	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	120	No
27	<i>Corymbia citriodora</i>	Spotted Gum	160	No
28	<i>Corymbia citriodora</i>	Spotted Gum	230	No
29	<i>Corymbia citriodora</i>	Spotted Gum	160	No
30	<i>Corymbia citriodora</i>	Spotted Gum	170	No
Total scats (/30)				1/30
Percentage				3
East Coast (med-high) Activity Category				Low



Spot Assessment Technique (SAT) Survey				
Date: 28.08.25		SAT ID: 5 (MHQA Transect 5)		
Tree No.	Scientific Name	Common Name	DBH	Scat present?
1	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	140	No
2	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	130	No
3	<i>Corymbia citriodora</i>	Spotted Gum	400	No
4	<i>Corymbia citriodora</i>	Spotted Gum	280	No
5	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	220	No
6	<i>Corymbia citriodora</i>	Spotted Gum	230	No
7	<i>Corymbia citriodora</i>	Spotted Gum	210	No
8	<i>Corymbia citriodora</i>	Spotted Gum	320	No
9	<i>Corymbia citriodora</i>	Spotted Gum	410	No
10	<i>Corymbia citriodora</i>	Spotted Gum	300	No
11	<i>Corymbia citriodora</i>	Spotted Gum	250	No
12	<i>Corymbia citriodora</i>	Spotted Gum	260	No
13	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	190	No
14	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	No
15	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	180	No
16	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	240	No
17	<i>Corymbia citriodora</i>	Spotted Gum	260	No
18	<i>Corymbia citriodora</i>	Spotted Gum	340	No
19	<i>Corymbia citriodora</i>	Spotted Gum	330	No
20	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	820	No
21	<i>Corymbia citriodora</i>	Spotted Gum	290	No
22	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	250	No
23	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	300	No
24	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	180	No
25	<i>Corymbia citriodora</i>	Spotted Gum	320	No
26	<i>Corymbia intermedia</i>	Pink Bloodwood	190	No
27	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	320	No
28	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	490	No
29	<i>Eucalyptus melanophloia</i>	Silver Leaf Ironbark	260	No
30	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	240	No
Total scats (/30)				0/30
Percentage				0
East Coast (med-high) Activity Category				Low



Spot Assessment Technique (SAT) Survey				
Date: 28.08.25		SAT ID: 6 (MHQA Transect 6)		
Tree No.	Scientific Name	Common Name	DBH	Scat present?
1	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	230	No
2	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	No
3	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	280	No
4	<i>Corymbia citriodora</i>	Spotted Gum	220	No
5	<i>Corymbia citriodora</i>	Spotted Gum	190	No
6	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	320	No
7	<i>Corymbia citriodora</i>	Spotted Gum	190	No
8	<i>Corymbia citriodora</i>	Spotted Gum	260	No
9	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	270	No
10	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	390/260	No
11	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	160/160	No
12	<i>Corymbia citriodora</i>	Spotted Gum	300	No
13	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	240	No
14	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260/180	No
15	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	100	No
16	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	120	No
17	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	160	No
18	<i>Corymbia citriodora</i>	Spotted Gum	320	No
19	<i>Corymbia intermedia</i>	Pink Bloodwood	130/100	No
20	<i>Corymbia intermedia</i>	Pink Bloodwood	160/150	No
21	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	340	No
22	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	No
23	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	260	No
24	<i>Corymbia intermedia</i>	Pink Bloodwood	290	No
25	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	280	No
26	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	440/200	No
27	<i>Corymbia citriodora</i>	Spotted Gum	260	No
28	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	210	No
29	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	100	No
30	<i>Eucalyptus crebra</i>	Narrow Leaf Ironbark	240	No
Total scats (/30)				0/30
Percentage				0
East Coast (med-high) Activity Category				Low



Appendix E

Offset Assessment Guide
Calculator Results and Uplift
Tables



AU1 - Attribute	Current Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Recruitment of woody perennial species	5	5	5	5	5	Immediate	Recruitment of EDL dominant species will be maintained >75% as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Establish photo monitoring points where remedial tree planting occurs at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Recruitment is currently 100% of the benchmark. If recruitment falls to less than 75% then remedial actions to improve recruitment will be applied. These include refining weed and fire control methods and increasing remedial plantings.
Native plant species richness – Trees	2.5	2.5	5	5	5	10 years	All of the expected tree species to be present as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness is currently at 60% of the benchmark. Recruitment of tree species is to be greater than 75% at 10 years as specified above. If the sub-canopy layer species richness has not improved to greater than 95% at 10 years then remedial actions to improve the prospect of achieving 95% in 15 years will be applied. These include remedial plantings of advanced stock.
Native plant species richness - Shrubs	2.5	2.5	5	5	5	10 years	All of the expected shrub species to be present as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Shrub species richness is currently at 33.33% of the benchmark. If the shrub species richness has not improved to greater than 90% at 10 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Grasses	0	0	2.5	2.55	5	20 years	All of the expected grass species to be present as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years..	Grass species richness is currently at 22.73% of the benchmark. If the grass species richness has not improved to greater than 90% at 10 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Forbs	0	0	2.5	2.5	5	20 years	Native forb species richness between 25% and 90% of the benchmark will be maintained as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Forb species richness will be maintained above 17.65% of the benchmark. If the forb species has not reached 25% at 10 years then remedial actions to improve the prospect of achieving between 90% in 20 years will be applied. These include remedial plantings.
Tree canopy height	4	4	4	5	5	15 Years	A median tree height greater than 70% of the benchmark will be achieved as a result of 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If tree height is not achieved above 70% at 15 years, then the prospect of extending the management period can be investigated. By Year 15 species plantings to be a minimum of 70% of the tree canopy height benchmark.
Tree canopy cover	3.5	3.5	3.5	5	5	15 years	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If canopy cover is not above 50% at 15 years then remedial actions to improve the prospect of achieving between 50% and 200% in 20 years will be applied. These include remedial plantings of advanced stock.
Shrub canopy cover	5	5	5	5	5	Immediate	Canopy cover to be between 50% and 200% of the benchmark as a result of specific	Baseline Site Condition attributes are established. Habitat quality transects to be completed by	If the shrub canopy cover is not maintained at greater than 50% at 15 years then remedial actions to



AU1 - Attribute	Current Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
							management actions 1 to 6 in Table A45 .	suitably qualified professionals at 5, 10, 15 and 20 years.	improve the prospect of achieving between 50% and 200% in 20 years will be applied. These include remedial plantings.
Native perennial grass cover	5	5	5	5	5	Immediate	Native grass cover to maintained at least 90% of the benchmark by specific management actions 11 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years..	If the native perennial grass cover is not maintained at greater than 90% in 10 years then remedial actions will be applied. These include refining weed and fire control methods to ensure native grass cover is maintained.
Organic litter	3	3	3	3	5	20 years	Organic litter to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If organic litter has not achieved greater than 50% at 10 years then remedial actions to improve the prospect of achieving between 50% and 200% in 20 years will be applied. These include refining weed and fire control methods to ensure organic litter is maintained.
Large trees	5	5	5	5	5	Immediate	The number of large trees will be maintained between 0% and 50% of the benchmark as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	The number of large trees will be maintained between 0% and 50%.
Coarse woody debris	2	2	2	5	5	15 years	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20years.	Coarse woody debris is currently 17.47% of the benchmark due to current and historical land uses. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% then remedial actions will be applied. These include a review of actions that impact on coarse woody debris such as fire regimes and importing native tree debris if necessary.
Weed cover	0	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years. An additional survey is to be completed at Year 3 to track progress to the Year 5 milestone objective.	Weed cover is currently 55% of the benchmark. If improvement to below 5% has not been achieved by the end of Year 10 then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Quality and availability of food and foraging habitat	20	20	20	40	40	15 Years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of food and foraging habitat is currently moderate. All site condition remedial actions also apply to this criterion achieving a high rating.
Quality and availability of shelter	4	4	4	20	40	20 Years	Quality and availability of shelter will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of shelter is currently moderate. All site condition remedial actions also apply to this criterion achieving a high rating.
Site Condition Score	61.5	66.5	81.5	123	150				
Overall Site Condition Score out of 3	1.15	1.25	1.53	2.31	2.81				
Size of patch	0	0	0	10	10	NA	The paddock areas when rehabilitated will become part of the patch by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	The paddock is not currently part of the patch. Once vegetation reestablishes and the canopy closes the area will join the patch.
Connectedness	4	4	4	4	4	NA	NA	NA	NA
Context	4	4	4	4	4	NA	NA	NA	NA



AU1 - Attribute	Current Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Ecological Corridors	6	6	6	6	6	NA	NA	NA	NA
Role of site location to species overall population in the state	5	5	5	5	5	NA	NA	NA	NA
Threats to the species	7	15	15	15	15	1 year	Threats to species including barbed wire fencing, non-native predators and WONS will be reduced to low levels and the site secured by specific management actions 1 to 6 outlined in Table A45 .	Baseline attributes are established. This criterion is reliant upon the suppression and control of pest species and WONS and bushfire and securing the offset site. Pest monitoring will be evaluated as per the pest management program.	The control of pest species will provide an immediate and large reduction in threats. If monitoring as per the pest management program indicates pest species are not reduced then the management plan will require amendment and improved control demonstrated.
Species mobility capacity	7	7	7	7	7	Immediate	Species mobility capacity will be improved to minor restriction (<25%) by specific management actions 1 to 6 in Table A45 .	Baseline attributes are established. Establish strategic photo monitoring points at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species mobility is currently moderately restricted by the absence of habitat and presence of weeds and pests.
Site Context Score	33	41	41	51	51				
Overall Site Context Score (out of 3)	1.77	1.71	1.71	2.73	2.73				
Presence	10	10	10	10	10	Immediate	NA	Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	NA
Usage	5	5	5	15	15	15 Years	Under the management actions specified under management actions 1 to 6 in Table A45 Koala usage of the site will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If Koala usage has not improved to breeding level by 15 years then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala usage.
Approximate Density	10	10	10	10	10	Immediate	Under the management actions specified in management actions 1 to 6 in Table A45 at least low level Koala activity (<22.52% scats recorded using the East Coast med-high population category) will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If density levels are not maintained at low level at the 10 year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala activity has not improved to low level by Year 15 then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala activity.
Role of the population	5	5	5	5	5	Immediate	NA	NA	NA
SSR Score (out of 70)	30	30	30	40	40				
SSR Score out of 4	1.71	1.71	1.71	2.29	2.29				
Total Habitat Quality Scores	4.64	5.16	5.44	7.32	7.83				



AU2 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Recruitment of woody perennial species	5	5	5	5	5	Immediate	Recruitment of EDL dominant species will be maintained >75% as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Establish photo monitoring points where remedial tree planting occurs at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Recruitment is currently 100% of the benchmark. If recruitment falls to less than 75% then remedial actions to improve recruitment will be applied. These include refining weed and fire control methods and increasing remedial plantings.
Native plant species richness – Trees	2.5	2.5	2.5	2.5	5	20 years	Native tree species richness greater than 90% of the benchmark will be achieved as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Tree species richness is currently at 80% of the benchmark. Recruitment of tree species is to be greater than 75% at 20 years as specified above. If the sub-canopy layer species richness has not improved to greater than 90% at 15 years then remedial actions to improve the prospect of achieving 95% in 20 years will be applied. These include remedial plantings of advanced stock.
Native plant species richness - Shrubs	2.5	2.5	2.5	2.5	5	20 years	All of the expected shrub species to be present as a result of specific management actions 11 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Shrub species richness is currently at 61.11% of the benchmark. If the shrub species richness has not improved to greater than 75% at 15 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Grasses	0	0	0	2.5	5	20 years	Native grasses species richness greater than 90% of the benchmark will be achieved as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Grass species richness is currently at 22.73% of the benchmark. If the grass species richness has not improved to greater than 75% at 15 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Forbs	2.5	2.5	2.5	2.5	5	20 years	All of the expected forb species to be present as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Forb species richness is currently at 38.24% of the benchmark. If monitoring indicates that forb species richness is not transitioning to over 90% at Year 15 then remedial actions will be applied. These include remedial plantings.
Tree canopy height	5	5	5	5	5	Immediate	A median tree height greater than 70% of the benchmark will be maintained as a result of 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If tree height is not maintained above 70% at 15 years, then the prospect of extending the management period can be investigated. By Year 15 species plantings to be a minimum of 70% of the tree canopy height benchmark.
Tree canopy cover	4	4	4	4	5	20 years	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If canopy cover is not approaching 50% at 15 years then remedial actions to improve the prospect of achieving between 50% and 200% in 20 years will be applied. These include remedial plantings of advanced stock.



AU2 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Shrub canopy cover	3	3	3	3	5	20 years	Shrub canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Shrub canopy cover is currently at 218.33% of the benchmark. If monitoring indicates that shrub canopy cover is not transitioning to between 50 and 200% by year 15 then remedial actions will be applied. These include remedial plantings.
Native perennial grass cover	5	5	5	5	5	Immediate	Native perennial grass cover greater than 90% of the benchmark will be maintained as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	The native perennial grass cover will be maintained over 90%.
Organic litter	3	3	3	3	5	20 years	Organic litter between 50% and 200% of the benchmark will be maintained as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Organic litter will be achieved between 50% and 200% by year 20. If monitoring indicates that litter cover is not transitioning to between 50 and 200% by year 15 then remedial actions will be applied. These include reviewing fire management controls and weed cover achievements.
Large trees	5	5	5	5	5	Immediate	The number of large trees will be maintained between 0% and 50% of the benchmark as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	The number of large trees will be maintained between 0% and 50%.
Coarse woody debris	0	0	0	2	5	20 years	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Coarse woody debris is currently 5.1% of the benchmark due to current and historical land uses. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% then remedial actions will be applied. These include a review of actions that impact on coarse woody debris such as fire regimes and importing native tree debris if necessary.
Weed cover	3	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years. An additional survey is to be completed at Year 3 to track progress to the Year 5 milestone objective.	Weed cover is currently 50% of the benchmark. If improvement to below 25% has not been achieved by the end of Year 5 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Quality and availability of food and foraging habitat	20	20	20	40	40	15 years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of food and foraging habitat is currently moderate. All site condition remedial actions also apply to this criterion achieving a high rating.
Quality and availability of shelter	20	20	20	40	40	15 years	Quality and availability of shelter will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of shelter is currently moderate. All site condition remedial actions also apply to this criterion achieving a high rating.
Site Condition Score	80.5	52.5	87.5	132	150				
Overall Site Condition Score out of 3	1.51	1.55	1.64	2.48	2.81				
Size of patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	4	4	4	4	4	NA	NA	NA	NA
Context	4	4	4	4	4	NA	NA	NA	NA
Ecological Corridors	6	6	6	6	6	NA	NA	NA	NA



AU2 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Role of site location to species overall population in the state	5	5	5	5	5	NA	NA	NA	NA
Threats to the species	7	15	15	15	15	1 year	Threats to species including barbed wire fencing, non-native predators and WONS will be reduced to low levels and the site secured by specific management actions 1 to 6 outlined in Table A45 .	Baseline attributes are established. This criterium is reliant upon the suppression and control of pest species and WONS and bushfire and securing the offset site. Pest monitoring will be evaluated as per the pest management program.	The control of pest species will provide an immediate and large reduction in threats. If monitoring as per the pest management program indicates pest species are not reduced then the management plan will require amendment and improved control demonstrated.
Species mobility capacity	7	7	7	7	7	Immediate	Species mobility capacity will be improved to minor restriction (<25%) by specific management actions 1 to 6 in Table A45 .	Baseline attributes are established. Establish strategic photo monitoring points at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species mobility is currently moderately restricted by the absence of habitat and presence of weeds and pests.
Site Context Score	43	51	51	51	51				
Overall Site Context Score (out of 3)	2.30	2.73	2.73	2.73	2.73				
Presence	10	10	10	10	10	Immediate	NA	Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	NA
Usage	15	15	15	15	15	Immediate	Under the management actions specified under management actions 1 to 6 in Table A45 Koala usage of the site will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If usage levels are not maintained at the 10 year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala usage has not improved to breeding level by 15 years then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala usage.
Approximate Density	10	10	10	10	10	Immediate	Under the management actions specified in management actions 1 to 6 in Table A45 at least low level Koala activity (<22.52% scats recorded using the East Coast med-high population category) will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If density levels are not maintained at low level at the 10 year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala activity has not improved to low level by Year 15 then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala activity.
Role of the population	5	5	5	5	5	Immediate	NA	NA	
SSR Score (out of 70)	40	40	40	40	40				
SSR Score out of 4	2.29	2.29	2.29	2.29	2.29				
Total Habitat Quality Scores	6.10	6.56	6.66	7.49	7.83				



AU 3 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Recruitment of woody perennial species	5	5	5	5	5	Immediate	Recruitment of EDL dominant species will be maintained >75% as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Establish photo monitoring points where remedial tree planting occurs at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Recruitment is currently 100% of the benchmark. If recruitment falls to less than 75% then remedial actions to improve recruitment will be applied. These include refining weed and fire control methods and increasing remedial plantings.
Native plant species richness – Trees	2.5	2.5	2.5	2.5	5	20 years	Native tree species richness greater than 90% of the benchmark will be achieved as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Tree species richness is currently at 50% of the benchmark. Recruitment of tree species is to be greater than 75% at 20 years as specified above. If the sub-canopy layer species richness has not improved to greater than 90% at 15 years then remedial actions to improve the prospect of achieving 95% in 20 years will be applied. These include remedial plantings of advanced stock.
Native plant species richness - Shrubs	2.5	2.5	2.5	2.5	5	20 years	All of the expected shrub species to be present as a result of specific management actions 11 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Shrub species richness is currently at 66.67% of the benchmark. If the shrub species richness has not improved to greater than 75% at 15 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Grasses	2.5	2.5	2.5	2.5	5	20 years	Native grasses species richness greater than 90% of the benchmark will be achieved as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Grass species richness is currently at 27.27% of the benchmark. If the grass species richness has not improved to greater than 75% at 15 years then remedial actions to improve the prospect of achieving 90% in 20 years will be applied. These include remedial plantings.
Native plant species richness - Forbs	2.5	2.5	2.5	2.5	5	20 years	All of the expected forb species to be present as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Forb species richness is currently at 52.94% of the benchmark. If monitoring indicates that forb species richness is not transitioning to over 90% at Year 15 then remedial actions will be applied. These include remedial plantings.
Tree canopy height	5	5	5	5	5	Immediate	A median tree height greater than 70% of the benchmark will be maintained as a result of 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If tree height is not maintained above 70% at 15 years, then the prospect of extending the management period can be investigated. By Year 15 species plantings to be a minimum of 70% of the tree canopy height benchmark.
Tree canopy cover	4	4	4	4	5	20 years	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If canopy cover is not approaching 50% at 15 years then remedial actions to improve the prospect of achieving between 50% and 200% in 20 years will be applied. These include remedial plantings of advanced stock.



AU 3 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Shrub canopy cover	3	3	3	3	5	20 years	Shrub canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Shrub canopy cover is currently at 393.33% of the benchmark. If monitoring indicates that shrub canopy cover is not transitioning to between 50 and 200% by year 15 then remedial actions will be applied. These include remedial plantings.
Native perennial grass cover	5	5	5	5	5	Immediate	Native perennial grass cover greater than 90% of the benchmark will be maintained as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	The native perennial grass cover will be maintained over 90%.
Organic litter	3	3	3	3	5	20 years	Organic litter between 50% and 200% of the benchmark will be maintained as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	Organic litter will be achieved between 50% and 200% by year 20. If monitoring indicates that litter cover is not transitioning to between 50 and 200% by year 15 then remedial actions will be applied. These include reviewing fire management controls and weed cover achievements.
Large trees	5	5	5	5	5	Immediate	The number of large trees will be maintained between 0% and 50% of the benchmark as a result of management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10 15, and 20 years.	The number of large trees will be maintained between 0% and 50%.
Coarse woody debris	2	2	2	5	5	15 years	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20years.	Coarse woody debris is currently 14.53% of the benchmark due to current and historical land uses. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% then remedial actions will be applied. These include a review of actions that impact on coarse woody debris such as fire regimes and importing native tree debris if necessary.
Weed cover	0	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years. An additional survey is to be completed at Year 3 to track progress to the Year 5 milestone objective.	Weed cover is currently 62.5% of the benchmark. If improvement to below 25% has not been achieved by the end of Year 5 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Quality and availability of food and foraging habitat	20	20	20	40	40	15 years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of food and foraging habitat is currently moderate. All site condition remedial actions also apply to this criterium achieving a high rating.
Quality and availability of shelter	20	20	20	40	40	10 years	Quality and availability of shelter will be improved to high by specific management actions 1 to 6 in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of shelter is currently moderate. All site condition remedial actions also apply to this criterium achieving a high rating.
Site Condition Score	82.0	87.0	92.0	135	150				
Overall Site Condition Score out of 3	1.54	1.63	1.73	2.53	2.81				
Size of patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	4	4	4	4	4	NA	NA	NA	NA
Context	4	4	4	4	4	NA	NA	NA	NA
Ecological Corridors	6	6	6	6	6	NA	NA	NA	NA



AU 3 - Attribute	Current Score	Year 5 Score	Year 10 score	Year 15 score	Year 20 score	Time Until Measured Benefit	Justifications / Management Actions	Monitoring	KPIs and Adaptive Management
Role of site location to species overall population in the state	5	5	5	5	5	NA	NA	NA	NA
Threats to the species	7	15	15	15	15	1 year	Threats to species including barbed wire fencing, non-native predators and WONS will be reduced to low levels and the site secured by specific management actions 1 to 6 outlined in Table A45 .	Baseline attributes are established. This criterium is reliant upon the suppression and control of pest species and WONS and bushfire and securing the offset site. Pest monitoring will be evaluated as per the pest management program.	The control of pest species will provide an immediate and large reduction in threats. If monitoring as per the pest management program indicates pest species are not reduced then the management plan will require amendment and improved control demonstrated.
Species mobility capacity	7	7	7	7	7	Immediate	Species mobility capacity will be improved to minor restriction (<25%) by specific management actions 1 to 6 in Table A45 .	Baseline attributes are established. Establish strategic photo monitoring points at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species mobility is currently moderately restricted by the absence of habitat and presence of weeds and pests.
Site Context Score	43	51	51	51	51				
Overall Site Context Score (out of 3)	2.30	2.73	2.73	2.73	2.73				
Presence	10	10	10	10	10	Immediate	NA	Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	NA
Usage	15	15	15	15	15	Immediate	Under the management actions specified under management actions 1 to 6 in Table A45 Koala usage of the site will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If usage levels are not maintained at the 10 year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala usage has not improved to breeding level by 15 years then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala usage.
Approximate Density	10	10	10	10	10	Immediate	Under the management actions specified in management actions 1 to 6 in Table A45 at least low level Koala activity (<22.52% scats recorded using the East Coast med-high population category) will be maintained.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If density levels are not maintained at low level at the 10 year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala activity has not improved to low level by Year 15 then the management period can be extended and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala activity.
Role of the population	5	5	5	5	5	Immediate	NA	NA	NA
SSR Score (out of 70)	40	40	40	40	40				
SSR Score out of 4	2.29	2.29	2.29	2.29	2.29				
Total Habitat Quality Scores	6.13	6.65	6.74	7.55	7.83				



Offsets Assessment Guide

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2 October 2012

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Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0									
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	11.46	Adjusted hectares	AU1	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	36.3	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	7.85	68.48%	No		
										Future area without offset (adjusted hectares)	36.3	Future area with offset (adjusted hectares)	36.3									
						Time until ecological benefit	20	Start quality (scale of 0-10)	5	Future quality without offset (scale of 0-10)	5	Future quality with offset (scale of 0-10)	8	3.00	75%	2.25	2.16					
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
	Mortality rate e.g. Change in number of road kills per year	No																				
	Number of individuals e.g. Individual plants/animals	No																				

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	11.46	7.85	68.48%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

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Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0									
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	11.46	Adjusted hectares	AU2	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	50.5	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	7.28	63.51%	No		
										Future area without offset (adjusted hectares)	50.5	Future area with offset (adjusted hectares)	50.5									
						Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	2.00	75%	1.50	1.44					
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
Number of features e.g. Nest hollows, habitat trees	No																					
Condition of habitat Change in habitat condition, but no change in extent	No																					
Threatened species																						
Birth rate e.g. Change in nest success	No																					
Mortality rate e.g. Change in number of road kills per year	No																					
Number of individuals e.g. Individual plants/animals	No																					

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	11.46	7.28	63.51%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

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Matter of National Environmental Significance	
Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0								
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)									
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	11.46	Adjusted hectares	AU3	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	14	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	2.29	19.95%	No	
										Future area without offset (adjusted hectares)	14.0	Future area with offset (adjusted hectares)	14.0								
						Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	8	2.00	85%	1.70	1.63				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
	Mortality rate e.g. Change in number of road kills per year	No																			
	Number of individuals e.g. Individual plants/animals	No																			

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	11.46	2.29	19.95%	No	\$0.00	#DIV/0!
	Area of community	0				\$0.00	\$0.00
						\$0.00	#DIV/0!

Assessment Unit - Regional Ecosystem	AU 1 Non-remnant RE12.12.5 paddock										
Site Reference	Transect 1	Transect 2	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	5	5	5	5	5	5	10	20	Remnant status will be achieved as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that remnant status will be achieved by 20 years. If regrowth status is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings and extension of the offset period if required.
Species Richness	2	4	3	5	5	5	10	10	Tree species richness will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.
Flower Score	0.755	0.64	0.6975	8	8	8	10	10	Flower score will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that flower score will improve to average 0.76 by 15 years. If the target flower score is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.

[illegible]

Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table 60.	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	5	47									
GHFF Foraging Tree Density - per hectare	25	235	130	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				4.25	4.86	5.26	6.60	7.00			

Assessment Unit - Regional Ecosystem	AU 2 Non-remnant RE12.12.5 vegetated										
Site Reference	Transect 3	Transect 6	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	5	5	5	5	5	5	10	20	Remnant status will be achieved as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that remnant status will be achieved by 20 years. If regrowth status is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings and extension of the offset period if required.
Species Richness	3	3	3	5	5	5	10	10	Tree species richness will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.
Flower Score	0.64	0.72	0.6800	8	8	8	10	10	Flower score will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that flower score will improve to average 0.76 by 15 years. If the target flower score is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.

[illegible]

Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table 60.	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	80	44									
GHFF Foraging Tree Density - per hectare	400	220	310	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				4.41	4.86	5.26	6.60	7.00			

GHFF FHA

Assessment Unit - Regional Ecosystem	AU 3 Remnant RE12.12.5										
Site Reference	Transect 4	Transect 5	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	20	20	20	20	20	20	20	20	Remnant status will be maintained as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that remnant status will be maintained. Remedial actions not required.
Species Richness	3	2	2.5	5	5	5	5	10	Tree species richness will be maintained as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that tree species richness will be maintained. Remedial actions not required.
Flower Score	0.72	0.4333	0.5767	8	8	8	8	8	Flower score will be maintained as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that flower score will be maintained. Remedial actions not required.

[illegible]

Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table 60.	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	49	68									
GHFF Foraging Tree Density - per hectare	245	340	292.5	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table 60.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				5.63	5.37	5.77	6.37	6.86			

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Matter of National Environmental Significance	
Name	GHFF
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0									
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	11.46	Adjusted hectares	AU1	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	36.3	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	7.85	68.48%	No		
										Future area without offset (adjusted hectares)	36.3	Future area with offset (adjusted hectares)	36.3									
						Time until ecological benefit	20	Start quality (scale of 0-10)	4	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	7	3.00	75%	2.25	2.16					
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
	Mortality rate e.g Change in number of road kills per year	No																				
	Number of individuals e.g. Individual plants/animals	No																				

Summary								
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)		
						Direct offset (\$)	Other compensatory measures (\$)	Total (\$)
	Birth rate	0				\$0.00		\$0.00
	Mortality rate	0				\$0.00		\$0.00
	Number of individuals	0				\$0.00		\$0.00
	Number of features	0				\$0.00		\$0.00
	Condition of habitat	0				\$0.00		\$0.00
	Area of habitat	11.46	7.85	68.48%	No	\$0.00	#DIV/0!	#DIV/0!
	Area of community	0				\$0.00		\$0.00
							\$0.00	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	GHFF
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																						
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
	Ecological Communities																					
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0									
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)										
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)										
	Threatened species habitat																					
	Area of habitat	Yes	11.46	Adjusted hectares	AU2	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	50.5	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	10.92	95.27%	Yes		
										Future area without offset (adjusted hectares)	50.5	Future area with offset (adjusted hectares)	50.5									
						Time until ecological benefit	20	Start quality (scale of 0-10)	4	Future quality without offset (scale of 0-10)	4	Future quality with offset (scale of 0-10)	7	3.00	75%	2.25	2.16					
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value		% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source
	Number of features e.g. Nest hollows, habitat trees	No																				
	Condition of habitat Change in habitat condition, but no change in extent	No																				
	Threatened species																					
	Birth rate e.g. Change in nest success	No																				
	Mortality rate e.g Change in number of road kills per year	No																				
	Number of individuals e.g. Individual plants/animals	No																				

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	11.46	10.92	95.27%	Yes	\$0.00	#DIV/0!
	Area of community	0				\$0.00	\$0.00
						\$0.00	#DIV/0!

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

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Matter of National Environmental Significance	
Name	GHFF
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator							
Impact calculator	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Ecological communities						
	Area of community	No		Area			
				Quality			
				Total quantum of impact	0.00		
	Threatened species habitat						
	Area of habitat	Yes		Area	19.1	Hectares	
				Quality	6	Scale 0-10	
				Total quantum of impact	11.46	Adjusted hectares	
	Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
	Number of features e.g. Nest hollows, habitat trees	No					
	Condition of habitat Change in habitat condition, but no change in extent	No					
	Threatened species						
	Birth rate e.g. Change in nest success	No					
	Mortality rate e.g. Change in number of road kills per year	No					
	Number of individuals e.g. Individual plants/animals	No					

Offset calculator																					
Offset calculator	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Ecological Communities																				
	Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset	0.0	Risk of loss (%) with offset	0.0								
										Future area without offset (adjusted hectares)		Future area with offset (adjusted hectares)									
						Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
	Threatened species habitat																				
	Area of habitat	Yes	11.46	Adjusted hectares	AU3	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	14	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	95%	0.00	0.00	1.14	9.98%	No	
										Future area without offset (adjusted hectares)	14.0	Future area with offset (adjusted hectares)	14.0								
						Time until ecological benefit	20	Start quality (scale of 0-10)	6	Future quality without offset (scale of 0-10)	6	Future quality with offset (scale of 0-10)	7	1.00	85%	0.85	0.82				
	Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start value		Future value without offset		Future value with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement met?	Cost (\$ total)	Information source	
	Number of features e.g. Nest hollows, habitat trees	No																			
	Condition of habitat Change in habitat condition, but no change in extent	No																			
	Threatened species																				
	Birth rate e.g. Change in nest success	No																			
	Mortality rate e.g. Change in number of road kills per year	No																			
	Number of individuals e.g. Individual plants/animals	No																			

Summary							
Summary	Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost (\$)	
						Direct offset (\$)	Other compensatory measures (\$)
	Birth rate	0				\$0.00	\$0.00
	Mortality rate	0				\$0.00	\$0.00
	Number of individuals	0				\$0.00	\$0.00
	Number of features	0				\$0.00	\$0.00
	Condition of habitat	0				\$0.00	\$0.00
	Area of habitat	11.46	1.14	9.98%	No	\$0.00	#DIV/0!
	Area of community	0				\$0.00	\$0.00
						\$0.00	#DIV/0!

Appendix F

Risk Assessment



Risk assessment for offset area

A qualitative risk assessment which considers the risks of achieving the objectives and outcomes for the offset area is presented in the table below. The risk assessment is completed in accordance with the EPBC Act Environmental Management Plan Guidelines (2014) and characterises risk as low, medium, high or severe, as derived from the likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical) risk matrix.

The risk analysis assesses the risk of failure to achieve the OMP management objectives. It is necessary to re-evaluate and modify the risk analysis and contingency measures throughout the period of EPBC Act approval, particularly if any unforeseen risks emerge or any negative outcomes identified are greater than expected.

During the first five (5) years of monitoring and Annual Compliance Reporting, the Offset Provider will review management commitments in this Offset Management Framework, and if the review results in the need to revise the framework it will be revised and submitted for approval. It is noted that events are only addressed once in the risk assessment under the most relevant management objective, however, some events are likely to impact on multiple management objectives.

Note, potential impacts from the occurrence of cyclones have been included within the risk analysis table. Cyclones, if to occur proximal to the offset area, are likely to result in indirect impacts only, including increased rainfall and wind events. Whilst the pathway of and occurrence of cyclones can change easily, becoming difficult to determine, an assessment of the potential associated risks has been completed. According to BoM (2019), cyclones have rarely traversed inland SEQ for at least the last 20 years, with the exception of Cyclone Debbie in 2017 and Cyclone Alfred in 2025. While the risk of cyclones occurring south of 25°S has increased in more recent years, it is unlikely a formed cyclone would occur at or proximal to the offset area location. This is due to a range of factors, including surrounding changes in topography, modified urban environment and lack of warm open water to provide continued energy generation¹.

¹ Bureau of Meteorology 2019, *Past Tropical Cyclones*, BoM, Australian Government, accessed at <http://www.bom.gov.au/cyclone/tropical-cyclone-knowledge-centre/history/past-tropical-cyclones/>
EPBC 2021/9070

Risk framework

		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Likelihood and consequence

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the plan's objectives. Results in short term delays to achieving plan objectives, implementing well characterised, high cost/effort corrective actions.
High	High risk of failure to achieve the plan's objectives. Results in medium-long term delays to achieving plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The plan's objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.

■ Critical

- The plan's objectives are unable to be achieved, with no evidenced mitigation strategies.

Risk assessment and management

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
To legally secure approved offset properties for conservation.	Failure to legally secure approved offset area. Legislative reform prejudices proposed tenure arrangements for offset properties.	Management action 1: Legally secure the offset area via a suitable method such as a voluntary declaration under the <i>Vegetation Management Act 1999</i> and a permanent securing mechanism agreed with the Department.	R	Mod	Low	Clearing of the 5.9 ha impact area cannot occur without legally securing the offset area.	N/A
Pest management	Failure to reduce the threat of introduced predators.	Management Action 2: - Conduct baseline surveys and determine relative abundance index. - Implement predator control program. - Conduct follow-up monitoring and implement further control.	U	Mod	Low	Monitoring of the presence of introduced predators through the use of remote motion-activated cameras; Survey the site to record the presence / absence of signs of introduced predator (sightings, killings and/or scats and tracks).	When the initial and ongoing introduced predator control measures do not result in a reduction of introduced predator numbers (compared to baseline survey), introduced predator program to be expanded/adapted to improve outcomes.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
							Any incidence of injury/mortality resulting from introduced predator attack will initiate supplementary monitoring and control measures. In the event that an offset species is found injured, transport immediately to a local vet, or suitably qualified and experienced wildlife carer.
WONS management	Failure to control WONS.	Management Action 3: Develop and implement a weed strategy, to maintain weeds listed with particularly ability to impact on movement and structural vegetation composition (predominantly <i>Lantana camara</i>), and	U	Mod	Low	Annual photo monitoring for the first three years and then year 5, 10, 15, and 20 years and mapping of weed infestations, and 5-year targeted transects and MHQA surveys of non-native plant cover to ensure low weed abundance across offset area.	If weed survey indicates weed cover has increased since previous survey, the weed control program will be expanded/ adapted to improve outcomes.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
		under the <i>Biosecurity Act 2014</i>, to reduce weed cover to target thresholds. Undertake weed management in accordance with the OMP.				Surveys in-line with weed management strategy. Repeated surveys of baseline data including 5 yearly habitat monitoring data as part of the framework.	
High intensity fire	A high intensity uncontrolled fire occurs within the offset area/s which causes loss of habitat.	Management Action 4: Actions as directed by the local authority including prescribed burning or other techniques undertaken in consultation with the Queensland Rural Fire Brigade and controlled grazing to manage fuel loads.	P	M	Med	Annual monitoring requirements to review access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of livestock.	If a wildfire occurs in the offset area, the following actions will be undertaken: - Implement fire control - Repair any fire breaks and access tracks. - Stay informed through the Rural Fire Service. - Assess damage caused by the wildfire and monitor for natural regeneration.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
							Monitoring to occur 3-6 months post event or after the next wet weather event (whichever is sooner).
Achieve performance targets and completion criteria for habitat	Landowner-approval holder agreements fail to adequately address management commitments in the offset plan.	Management Action 1-5: The offset area has been legally secured for conservation purposes. The development of this framework outlines specific management actions to achieve performance criteria.	U	Mod	Low	Scheduled monitoring/surveys and Annual Compliance Reports	- Review Offset Management Framework - Implement adaptive management and corrective actions
	The offset area fails to naturally regenerate.	Management Action 3: - Remove incompatible land uses. - WONS management (refer Management Action 3). - Sufficient rest period.	U	Mod	Low	After a sufficient rest period the repeat MHQA will indicate progress towards performance criteria.	Where natural regeneration is failing to thrive, assist natural regeneration through direct seeding and planting

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
							infill planting/ revegetation to be implemented after sufficient rest period.
	Failure to increase habitat for offset species.	Management Action 1: - legally secure offset area and remove incompatible land uses. Management Action 3: - Reduce the extent of weed as per criteria; and - Implement infill planting where required.	U	Mod	Low	Annual surveys (photo monitoring & audit of revegetation works) of revegetation area to ensure plant survival. Repeated surveys of baseline data including 5-yearly MHQA habitat monitoring data and annual observational data as part of the OMP.	If MHQA transects indicate habitat less than performance indicators, implement infill planting in weed control areas. When plant stock fails supplementary planting, direct seeding, weed control, fertiliser, amelioration or other management actions necessary to stimulate tree growth.

Management objective/desired outcome	Event or circumstance	Relevant management actions/measures	Residual risk			Trigger detection and monitoring activity/ies	Feasible/effective corrective actions
			L	C	RL		
	If infill planting is required and there is high plant stock failure.	Management Action 3: Adhere to planting method and watering schedule.				Annual plant stock audit (first 5 years). Planting and monitoring event schedules by the qualified bush regenerator.	If there is a high rate of plant stock failure adaptive management and corrective actions will be implemented including additional supplementary planting, direct seeding, weed control, fertiliser, water spike, mulching, tree guards, etc. where required.