

Ripley Residential Development EPBC Act (2024/09865)

Preliminary Documentation Report (PART A)

HB QLD Pty Ltd

17 February 2026

Saunders Havill

PATHWAYS TO SUCCESS

Executive Summary

This Preliminary Documentation has been prepared on behalf of the proponent, **HB QLD Pty Ltd** in direct response to additional information requested by the **Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW)** as part of the 'controlled action' assessment by 'preliminary documentation' determination for the residential development located at 187-197 Binnies Road, Ripley, made on 5 July 2024 (EPBC Reference: 2024/09865).

The controlled action decision is based on **DCCEEW's** assessment of the project as potentially resulting in a Significant Impact on the following Matters of National Environmental Significance (MNES):

- Listed Threatened Species & Communities (Sections 18 & 18A) more specifically defined in the request for further information on the:
    - Koala (*Phascolarctos cinereus*) combined populations of QLD, NSW and the ACT, listed as endangered, and
    - Grey-headed Flying-fox (*Pteropus poliocephalus*) listed as vulnerable.

Information provided within this report includes:

- A summary of the proposed development and a description of the assessment process;
- A description of the action including timeframes and staging;
- A description of MNES which may be affected by the proposal;
- Comments on 'critical habitat' for the Koala and suitable foraging habitat for the Grey-headed Flying-fox
- A discussion of empirical research about the impacts of development on MNES which may be affected by the proposal;
- Procedures to be implemented prior and during vegetation clearing and construction;
- Measures to avoid, minimise and mitigate potential impacts on MNES;
- Consideration of social and economic matters;
- Details of the proposed environmental offset for listed significant impacts, and;
- A number of preliminary mitigation and management measures for protection of MNES.

Impacts

The Binnies Road Residential Development site covers a total land area of 7.52 ha, of which 7.38 ha is considered to support vegetation defined by **DCCEEW** as 'critical habitat' for the Koala and potential foraging habitat for the Grey-headed Flying-fox (GHFF).



Environmental Offsets

Environmental offsets for the clearing of critical habitat for the survival of the Koala and potential foraging habitat for the Grey-headed Flying-Fox will be resolved by providing an environmental offset on land external to the referral area via a third party offset provider. Environmental offsets have been calculated and will be delivered in accordance with the EPBC Act Environmental Offset Policy. The offset area equates to **106.79%** of the impacted habitat for Koala and **135.81%** of impacted foraging habitat for Grey-headed Flying-fox

Management Plans & Mitigation Measures

Numerous management and mitigation measures and controls will be adopted as part of mandatory requirements conditioned by Economic Development Queensland (EDQ) due to the referral area's location within the Ripley Valley Priority Development Area (RVPDA) and best practice management adopted by **HB QLD Pty Ltd**. This document includes a number of preliminary management measures relating specifically to Koala and Grey-headed Flying-fox. The management measures remain preliminary to provide the **DCCEEW** with a level of certainty that potential impacts can be mitigated and managed. Vegetation, Fauna, Stormwater, Erosion and Sediment Control issues will all be managed through a mandatory need to deliver management plans to EDQ for assessment, approval and implementation, although it is noted that best practice controls proposed by **HB QLD Pty Ltd** go above and beyond mandatory EDQ standards.

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Acronyms and Abbreviations

Legislation, Policies and Guidelines

EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
VMA	*Vegetation Management Act 1999* (Qld)

Government Departments

DAWE	Department of Agriculture, Water and the Environment (Cth) – superseded
DAF	Department of Agriculture and Fisheries (Qld)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth), formally DAWE
DES	Department of Environment and Science (Qld) formally – superseded
DETSI	Department of Environment, Tourism, Science and Innovation
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning (Qld)
EDQ	Economic Development Queensland (as part of DSDIMP)
EHP	Department of Environmental and Heritage Protection (Qld) – superseded
ICC	Ipswich City Council
DNRME	Department of Natural Resources, Mines and Energy (Qld) – superseded
DOR	Department of Resources (Qld)
DTMR	Department of Transport and Main Road (Qld)

General Terms

ACR	Annual Compliance Report
KBA	Key Biodiversity Area
KHAT	Koala Habitat Assessment Tool
KSAT	Koala Spot Assessment Technique Survey
MNES	Matters of National Environmental Significance
MHQA	Modified Habitat Quality Assessment Tool
MSES	Matters of State Environmental Significance
PD	Preliminary Documentation
PDA	Priority Development Area
PMST	Protected Matters Search Tool
RE	Regional Ecosystems
RVPDA	Ripley Valley Priority Development Area
SBMP	Site Based Management Plan
SH	Saunders Havill
TEC	Threatened Ecological Community
VCFMP	Vegetation Clearing and Fauna Management Plan
WPMP	Wildlife Protection and Management Plan
WHIMP	Wildlife Habitat Impact Mitigation Plan
The Project	Ripley Residential Development Project
The Proponent	HB QLD Pty Ltd

Reference Documents

Draft Code

Hanger, J & Nottidgem B., Queensland code of practice for the welfare of wild animals affected by land-clearing and other habitat impacts and wildlife spotter / catchers, Australia Wildlife Hospital, 2009.

EPBC Environmental Offsets Policy

Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (October 2012), Commonwealth of Australia, 2012.

EPBC Offsets Guide

Environment Protection and Biodiversity Conservation Act 1999 How to use the offsets assessment guide, (October 2012), Commonwealth of Australia, 2012.

FSRDM

Fauna Sensitive Road Design Manual Volume 2: Preferred Practices, State of Queensland (Department of Transport and Main Roads), 2010.

SI Guidelines

Matters of National Environmental Significance: Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999, Commonwealth of Australia, 2013.

1. Introduction

Saunders Havill (SH) act on behalf of HB QLD Pty Ltd (the Proponent) in the coordination and production of the response to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Controlled Action Determination assessment via Preliminary Documentation (PD) for the proposed residential development (the project) located at 187-197 Binnies Road, Ripley, Queensland (EPBC Reference: 2024/09865).

On 26 April 2024 a referral under the EPBC Act was made to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a controlled action assessment. The proposed action was referred as 'not controlled' with an assessment of the proposed action against the applicable EPBC Act guidelines and policies, including the Significant Impact Guidelines 1.1 (SI Guidelines). The assessment concluded the proposed action as unlikely to have a significant residual impact on Matters of National Environmental Significance (MNES) as the highly isolated and small overall referral was not considered to have a significant impact on any MNES (refer to **Part B** for a copy of the original Referral Application).

On 5 July 2024 this application was deemed a Controlled Action requiring assessment by "Preliminary Documentation." The Controlled Action Determination was based on consideration of the potential of the project to significantly impact on the following Matters of National Environmental Significance (MNES):

- Listed threatened species and communities (sections 18 & 18A) protected under Part 3 of the EPBC Act, specifically:
    - Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT, listed as endangered, and
    - Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as vulnerable.

It is noted that the DCCEEW also considers there to be evidence that the following species listed under the EPBC Act may also be present, or have habitat present, on or within the vicinity of the referral area, and may also be impacted by the proposed action:

- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*), listed as vulnerable,
- Swift Parrot (*Lathamus discolor*), listed as critically endangered
- Regent Honeyeater (*Anthochaera phrygia*), listed as critically endangered
- Greater Glider (*Petauroides volans*), listed as endangered, and
- South-eastern Yellow-bellied Glider (*Petaurus australis australis*), listed as vulnerable

In receiving the July 2024 Controlled Action Determination, the DCCEEW provided a list of additional information required to be addressed within this Preliminary Documentation report. A copy of the request for additional information for assessment by PD is included as **Attachment A1**, and each item has been

extracted as each subsequent chapter of this PD report. As part of this assessment processes, this PD must be published for public comment.

The purpose of this PD report is to provide requested additional information to the DCCEEW to facilitate the Preliminary Documentation assessment process to obtain formal approval for the referred project.

For readability of this document, the supporting information has been separated into two folders using the following structure:

- **Part A: Preliminary Documentation report.**
- **Part B: Referral Material and Technical Studies.**

The following sections within this PD report address the item requirements of the request for additional information, and have been numbered to correspond to each of the additional information item requests, specifically:

- Section 2: Description of the Action.
- Section 3: Description of the Environment and Matters of National Environment Significance.
- Section 4: Assessment of Impacts.
- Section 5: Avoidance and Mitigation.
- Section 6: Proposed Offsets.
- Section 7: Economic and Social Matters.
- Section 8: Ecological Sustainable Development.
- Section 9: Environmental Record

Part B: Referral Material and Technical Documents refers to a copy of the full referral material submitted for the controlled action assessment as well as any supporting studies and request for information responses. It is noted that relevant sections from Part B have been brought forward and incorporated into Part A of the PD for ease of reference and readability. It is also noted that changes to the referral material are not possible, and Part A of the PD supersedes the information in the referral.

1.1. Purpose

The purpose of this report is to provide information to the Department to facilitate the PD assessment process and ultimately obtain approval under the EPBC Act for the Ripley Road Residential Development.

1.2. Document Structure

Preliminary Documentation refers to this document. It includes relevant figures, plans and supporting material required to support full assessment of the action by the Department. These have been referenced with prefix A (*i.e.,* Figure A1, Plan A1, Attachment A1). Refer to the above Table of Contents for a consolidated list of the figures, plans, and attachments.

1.3. Reference Table

This section provides a reference table demonstrating where in the documentation the information requirements are addressed (refer **Table A1**). The information request is included as **Attachment A1**. Each item has been extracted and provided within the corresponding section of this PD.

Table A1: Reference table

Item		Response Section
1	**n/a – General content, format and style**	**n/a**
2	**Description of the action**	
2.1	a) A description of all components of the proposed action (such as preconstruction, construction and operational), including the staging, sequencing, duration and timing.	2.1.1
	b) A description of the anticipated start and completion dates of all actions such as the extent, staging and timing of clearing undertaken over the construction period.	2.1.3
	c) The location, extent, and size (in hectares) of the total project footprint, disturbance/impact footprint, and of any adjoining areas (beyond the impact area) that may be subject to indirect or facilitated impacts, including edge effects, noise or light spill, vehicle access or other associated activities.	2.1.4
	d) A description, with supporting spatial information, detailing all site access roads and any other shared infrastructure with adjacent projects/areas to be constructed to facilitate the proposed action.	2.1.5
2.2	Provide a description of the intended land uses proposed as part of the completed development, including if any proposed open space and/or conservation areas and associated ongoing activities, and details of the intended party that would be responsible for future management activities.	2.2
2.3	Details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies or is likely to apply to the proposed action. Details should include (but are not limited to): a) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy? b) application/approval numbers for existing applications where relevant c) obtained approvals or additional approvals that are required.	2.3
3	**Description of the environment and Matters of National Environmental Significance**	
3.1	A description of the environment more broadly including previous and current land use within and surrounding the proposed action area.	3.1
3.2	A description of any potential listed threatened species or ecological community (including but not limited to those listed in this request for information) that occur in the project area and adjacent areas.	3.1

	Please ensure that a recent Protected Matters Search Tool report is generated and used during the assessment before finalising the draft preliminary documentation to identify any additional species (listed at the time of the controlled action area) that may be affected by the proposal.	
3.3	For listed threatened species identified in section 4 of this request for information, please provide a likelihood of occurrence assessment including the following: a) Information on the abundance, distribution, ecology and habitat preference of the species or communities. b) Quantification of the extent of habitat (including maps identifying known or potential habitat) on site and, where feasible, in the broader landscape. c) Quality and importance of known or potential habitat for the species or communities. d) Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations. e) Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site. Include a likelihood of occurrence assessment for all other listed threatened species and ecological communities that are identified in a recent Protected Matters Search Tool (PMST) report, and provide further assessment as directed above for other species are likely to occur within and adjacent to the project area.	3.4
3.4	Up to date baseline and survey data at the impact site(s), and if relevant, the proposed offset site(s), including: a) Information on the survey methodology or technique used (e.g., thermal detection, camera trapping, tree hollow search, SAT surveys etc) b) When surveys were conducted (e.g., dates, time of day, season, etc.) and survey effort (e.g., two hours for every one hectare within a 5-hectare area) c) Map/s of survey points or transects and how the survey points or transects were selected. d) An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. e) Results of all surveys undertaken	3.2/3.3

3.5	Based on survey data and with reference to relevant statutory documents, provide a clear description of the total extent and quality of habitat present within and surrounding the proposed action area for each species or ecological community potentially present or impacted by the action. For all species with residual significant impacts the method used to quantitatively assess the quality of habitat must be discussed and endorsed by the department before being applied.	3.2/3.3
4	**Impact Assessment**	
4.1	Include a clear description of the total extent and quality of the following: a) project footprint (including the total extent of habitat present for each relevant protected matter) b) direct and indirect impact areas (including the total extent of habitat for each relevant protected matter to be impacted) c) total areas proposed to be retained/avoided (including the total extent of habitat present for each relevant protected matter to be avoided).	4
4.2	To inform point 4.1, please provide an assessment of the direct, indirect, facilitated and cumulative impacts that may occur as a result of the proposed action at a local and regional scale. The assessment should include consideration of: a) the nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable or irreversible. b) timing and whether the impact is temporary or permanent c) species specific habitat requirements such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable). d) whether connectivity and movement opportunities in the surrounding area may be retained, removed or functionally lost or compromised. e) adjacent areas of habitat that may or will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence)	4/5.3

	f) indirect or facilitated impacts that may result from the proposed action, including but not limited to the following: i. Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment. ii. Vehicle movement – potential increase of vehicles to strike fauna in the pre-construction, construction, and operation phase of the project. iii. Increased presence of dogs – pre-construction, construction and operation phases have the potential to increase dog presence in the referral area and adjacent environment. iv. Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil in the pre-construction and construction phase of the project. v. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during construction and operation of the residential development. g) cumulative impacts, where potential project impacts on MNES are in addition to existing impacts of other activities (including current or future developments by the proponent and other proponents in the region and vicinity)	
4.3	Include current maps and coordinates/shapefiles showing the total project footprint, total disturbance/direct and indirect impact areas, areas of habitat for MNES proposed to be retained.	N/A
4.4	Include details of any policy guidelines, relevant studies, surveys, or consultations with species experts/field specialists, which were not included in the referral or additional information provided in support of the referral.	N/A
5	**Avoidance and Mitigation Measures**	
5.1	Demonstrate that you have applied the mitigation hierarchy and exhausted all options to avoid and mitigate harm to protected matters, before resorting to environmental offsets. In doing this, you must demonstrate that any avoidance or mitigation measures will provide ecological benefits to the species in the long-term. For example, on site avoidance/conservation areas must be connected or provide connectivity opportunities for species in the broader landscape, and must include enduring mitigation of impacts from adjacent development.	5
5.2	Provide details (including a summary list or table) of avoidance and mitigation measures proposed to be undertaken to prevent or minimise impacts on protected matters (or their habitat) from the proposed action area, including: a) a description of avoidance measures that have been considered and applied. For example, project site selection to avoid valuable habitat, micro-siting of infrastructure to avoid impacts on habitat on site, or avoidance of any activity that may indirectly impact on essential lifecycle processes for species.	5.2

b) a description of proposed safeguards and mitigation measures to minimise and manage relevant impacts of the action, with reference to relevant statutory or policy documents at the Commonwealth and State level (e.g., Guideline: State Development Assessment Provisions (State Code 25))
c) pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.
d) measures to address the risk of species, such as the koala, entering the residential area and becoming trapped/isolated without resources for shelter whilst in the residential area and safe movement opportunities to get out of the residential area, along with sufficient information on the location and design of these measures.
e) Ongoing management of direct and indirect impacts due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by negotiating various fence types.
f) details of how speed reduction is to be achieved (e.g., traffic calming devices) and plans showing the locations of each of these features and the manner in which they will be implemented).
g) information on safe road design and placement, including installation of crossing warning signs, wildlife threshold marking on road (include maps and imagery).
h) the locations and size of any proposed fauna movement solutions, fire breaks, nogo or buffer zones (including buffers between the construction footprint or remaining habitat in the referral area and adjacent to the site), and potential fencing, including:
    i. the location of any movement solutions, fire breaks, buffer zones, or fencing.
    ii. the characteristics of the fauna movement solutions, fire breaks, buffer zones and fencing, (i.e., height, length, wildlife proof measures etc)
    iii. whether the proposed measures, such as fencing will provide a wildlife barrier to/from/within the proposed action area.
i) a description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes.
j) information on the timing, frequency, and duration of the measures to be implemented.
k) an actual or estimated cost of the mitigation measures.

5.3	Provide an assessment of the predicted effectiveness of each proposed avoidance or mitigation measure, noting that the effectiveness of a particular measure is a reflection of confidence in the anticipated outcome. The assessment of effectiveness	5.3



	should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome.	
5.4	For each measure proposed, indicate the: a) impacts that are being avoided and/or the significance of impacts being reduced through mitigation. b) Scientific basis for conclusions being drawn c) an evidence-based likelihood of success/risk assessment d) responsible party e) milestones / performance / completion criteria f) proposed monitoring and evaluation program.	5.3
5.7	All proposed measures must consider the 'S.M.A.R.T' principle: S – Specific (protected matter-specific objectives, methods, outcomes, and repeatability) M – Measurable (baseline information, quantifiable, auditable) A – Achievable (timeframes, financial and human resources) R – Relevant (conservation advice, recovery plans, threat abatement plans) T – Time-bound (set implementation, performance and completion timeframes).	5.3
6	**Proposed offset** a) Offset Proposal b) Offset Management Plan	6 (Attachment A5 - OMP)
7	**Habitat Quality Assessment** a) Details on the Modified Habitat Quality Assessment (MHQA) method utilised	
8	**Economic and Social Matters**	
8.1	Provide details on the social and economic costs and/or benefits of undertaking the proposed action, including the basis for any estimations of costs and/or benefits. Where possible, please include the total economic capital investment and economic ongoing value of the project.	7
8.2	Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.	
8.3	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.	7

8.1	Provide details of any consultation with Indigenous stakeholders.	7
9	**Ecologically Sustainable Development**	
9.1	Provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act, which are as follows: a) decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations. b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making	8
10	**Environmental record of the person proposing to take the action**	
10.1	the person proposing to take the action;	
10.2	for an action for which a person has applied for a permit, the person making the application;	9
10.3	if the person is a body corporate—the history of its executive officers in relation to environmental matters; and	
10.4	if the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.	

1.1. Site Description and Details

The Proponent seeks to develop the referral area, described as Lot 335 on RP814578, for residential uses (refer **Plan A1**). This land parcel occupies a north-western property within the RVPDA. The referral area and all surrounding land is zoned as 'urban living' under the RVPDA development scheme and as such has been earmarked for development (refer **Plan A2** and **Plan A3**). RVPDA is a key development area in SEQ specifically utilised to cater for the increased population growth in the region. The referral area is shown in **Figure A1** and **Figure A2** and key property details are presented in **Table A2**.

The referral area is located within the north-western portion of the RVPDA, approximately 6 kilometres (km) south-east of Ipswich Town Centre, 1.2km north of the Centenary Highway and 1km south of the Cunningham Highway. The referral area is a 7.52 ha vegetated lot bound by Binnies Road to the south, Daleys Road to the west, Tempo Drive to the east and residential developments under construction to the north and east. The development layout is shown as **Plan A1**. Key site details are presented in **Section 1.1.**

Table A2: Property summary

Address	187-197 Binnies Road, Ripley, Queensland, 4306
RPD	Lot 335 on RP814578
Area	7.52 ha
Protected Plants	Wholly within high-risk area
VMA 1999	Category X (non-remnant) Category B (Least Concern RE 12.9-10.2) Category C (Least Concern 12.9-10.2) Category C (Of Concern 12.9-10.7) Category C (Of Concern 12.9-10.16)
Fisheries 1994	Nil
MSES	MSES – Wildlife habitat (special least concern animal) MSES – Wildlife habitat (koala habitat areas – core) MSES – Regulated vegetation (category C) MSES – Regulated vegetation (essential habitat)
Koala Habitat	Wholly outside of Koala priority area Core koala habitat area on site
PDA	Ripley Valley Priority Development Area (RVPDA)
LGA	Ipswich City Council (as administrator for Economic Development Queensland)
Planning Scheme / Local Plan	Ripley Valley Priority Development Area (RVPDA) Development Scheme
Zoning	Urban Living
Existing Land Use	Vacant Bushland
Proposed Land Use	Residential Development

2. Description of the Action

This section responds to Item 2 of the PD request which requires the proponent to provide a description of the action.

The proponent is proposing a residential development including 127 residential allotments, pedestrian links, internal roads, and detention/drainage areas on freehold land located at 187 – 197 Binnies Road, Ripley, Queensland described as Lot 335 on RP814578 (refer **Plan A1**).

The referral area is zoned as 'urban living' under the RVPDA (refer **Plan A2**), which is the same as the proposed disturbance footprint, is a vacant 7.52-hectare patch of vegetation situated between roads and existing/future developments (refer **Table A3**).

Table A3: Details on impact area

Address	187-197 Binnies Road, Ripley, Queensland, 4306
RPD	Lot 335 on RP814578
Referral Area	7.52 ha
Impact Area	7.52 ha
MNES habitat (Koala/GHFF)	7.38 ha

2.1. Components of action, staging, sequencing, duration and timing

Item 2.1(a) of the PD Request asks for "***A description of all components of the proposed action (such as preconstruction, construction and operational), including the staging, sequencing, duration and timing.***"

2.1.1 Components of the action

The proposed action is for a residential development which will provide 127 dwellings for future residents in South Ripley.

The proposed action will involve the following uses and activities:

- Residential living
- Pedestrian links
- Stormwater infrastructure including bio-retention basins.
- Internal access roads
- Landscape architecture including feature planting, footpaths and lighting

To achieve the proposed outcome of the project, the following activities will occur across the referral area which are considered typical of an urban development project:

- Pre-clearance fauna surveys and clearing of vegetation only under the supervision of fauna spotter catchers that holds a permit issued by the Queensland Government Department of Environment, Tourism, Science and Innovation (DETSI);
- Bulk earthworks to achieve the required grades across the referral area;
- Installation of utility services (potable water services, sewerage linking and electricity) and stormwater devices and water quality management;
- Creation of residential lots and internal roads as per the development layout (refer **Plan A1**);
- Construction of dwellings and landscape works including the installation of street trees, footpaths, seating areas and path/street lights.

Pre-clearing

Prior to clearing, the extent of vegetation to be cleared will be marked with fauna friendly tree protection fencing. No vegetation is proposed to be retained within the referral area and no vegetation is present immediately adjacent. Access to the referral area is already available through existing adjacent roads. Preclearing procedures are addressed in detail in **Section 5.2.2**.

Construction

The construction phase of the project will involve bulk earthworks, installing utility services and roads and construction of residential lots and dwellings

Operation

The operational phase of the project will see the referral area utilised for residential uses typical of an urban development.

2.1.2 Stage and sequencing

Activities necessary to deliver this project include vegetation clearing, construction of residential dwellings and internal roads, pathways, and infrastructure including for stormwater and drainage, and ongoing standard maintenance of the associated roads, pathways, and infrastructure. The entire site (7.52 ha) will be cleared as a single event to accommodate earthworks requirements for each stage of development.

The reconfiguration of the lot into 127 allotments and construction of a new road network and drainage reserve will be delivered over 3 stages (refer **Table A4** and **Plan A1**):

Table A4: Construction staging of the development

Stage	Area (ha)	No. of Lots	Area of Road (ha)	Area of Drainage Reserve (ha)
1	2.87	38	0.68	0.544
2	4.08	76	0.97	0.037
3	0.57	13	0.11	N/A
TOTAL	**7.52**	**127**	**1.76**	**0.58**



2.1.3 Timeframes and duration

Item 2.1(b) of the PD Request asks for **"a *description of the anticipated start and completion dates of all actions such as the extent, staging and timing of clearing undertaken over the construction period.*"**

The start date and completion date of the proposed development are as follows:

Start Date: 09/2025
End Date: 12/2026

The proposed development intends to commence clearing and civil works in Sep-2025. Given the small overall area of the referral area (7.52 ha), it is anticipated that clearing is to occur over one stage with construction completed by December 2026.

2.1.4 Location, extent and size of project

Item 2.1(c) of the PD Request asks for "***The location, extent, and size (in hectares) of the total project footprint, disturbance/impact footprint, and of any adjoining areas (beyond the impact area) that may be subject to indirect or facilitated impacts, including edge effects, noise or light spill, vehicle access or other associated activities.***"

The referral area is located within the north-western portion of the RVPDA, approximately 6 kilometres (km) south-east of Ipswich Town Centre, 1.2km north of the Centenary Highway and 1km south of the Cunningham Highway. The referral area is 7.52 ha in size and is bound by Binnies Road to the south, Daleys Road to the west, Tempo Drive to the east, and residential developments to the north. The broader landscape is shifting from large lot rural residential land to smaller lot residential development as per the RVPDA designation.

Land adjoining the referral area to the south-east remains for now as large lot rural residential. Land adjoining the referral area to the west and south beyond is currently vacant bushland, mapped as Category B (remnant) and Category C (high-value regrowth) vegetation. However, like much of the surrounding area, these areas of vacant bushland are covered by development approvals and applications. To the south of the referral area is Binnies Road which has not been fully constructed, however, this road has been conditioned for upgrade under the adjacent development approval, 2834/2019/PDA, and will therefore become a more significant barrier to wildlife movement (refer **Plan A3**).

Indirect impacts may occur when project related activities affect vegetation or habitats in a manner other than a direct loss or clearing, such as for example, soil erosion, sedimentation of waterways, dust inhibiting plant pollination, provision of suitable seed bed for invasive plants, or increased noise activity within of directly adjacent to sensitive habitat areas.

The potential for indirect impacts is considered highly unlikely given the referral area is presently surrounded on all sides by roads and residential developments. No existing vegetation immediately adjoins the referral area boundaries. However, the potential for indirect impacts that may result from construction activities and/or the operational phase of the project are included below with a full assessment provided in **Section 4**

- Weeds
- Vehicle Movement
- Earthworks
- Light Emissions During Construction
- Noise and Vibration
- Waste Disposal
- Hazardous and Dangerous Goods
- Increased Human Presence

2.1.5 Adjacent projects to be constructed

Item 2.1(d) of the PD Request asks for "***A description, with supporting spatial information, detailing all site access roads and any other shared infrastructure with adjacent projects/areas to be constructed to facilitate the proposed action.'***

The referral area is situated in a landscape that has seen rapid urbanisation following the designation of the RVPDA in 2011 with large lot rural residential properties progressing to small lot developments and further development anticipated with EPBC and EDQ Approved sites present throughout the landscape. Vegetation clearing has steadily occurred to facilitate urban developments associated with planning intent of RVPDA (refer **Plan A4** for aerial imagery).

Properties on all sides of the referral area are either fully developed, under construction or future developments (refer **Plan A3**). As part of this, a road network including Daleys Road to the west and Tempo Drive to the east have been completed. Additionally, under the approval for 2834/2019/PDA (refer **Plan A3**), Binnies Road to the south has been conditioned to be upgraded to support the anticipated increase in vehicle movement in the local region. At present, Binnies Road remains partly as a dirt access track. The upgrade of Binnies Road will be delivered irrespective of the referral area being developed, thus ultimately impeding safe fauna movement to the referral area from the south. All roads that will facilitate access to the referral area have either been completed or will be completed as conditioned under separate applications.

2.2. Land Uses

Item 2.2 of the PD Request asks for provision of a "***A description of the intended land uses proposed as part of the completed development, including of any proposed open space and/or conservation areas and associated ongoing activities, and details of the intended party that would be responsible for future management activities."***

The referral area is situated within the RVPDA and is zoned 100% as 'urban living' with no 'environmental protection' zoning adjacent (refer **Plan A2**). The purpose of this zoning is to utilise areas of high disturbance and minimal ecological context for development, ultimately alleviating the housing pressure in SEQ and minimising development within vegetated areas identified to contribute to landscape level connectivity. The referral area is surrounded on all sides by roads and developments with all neighbouring land also zoned as 'urban living.' Therefore, the referral area is not strategically positioned to provide any ecological linkages at present or in the future where connectivity potential will only lessen. It is therefore not appropriate to retain vegetation within the referral area as any retained areas will not contribute to functional movement corridors. Furthermore, it is not suitable to promote fauna movement into the referral area where threats are abundant in the form of existing roads, and residential dwellings.

Development is proposed over the entire 7.52 ha referral area with land used for housing lots, internal access roads and drainage services (refer **Plan A1**). No vegetation is proposed to be retained as open space or conservation.

2.3. Local and/or State Planning Scheme, Plans and/or Policies

Item 2.3 of the PD Request asks for, ***"Details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies or is likely to apply to the proposed action. Details should include (but are not limited to):***

a) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy?

b) application/approval numbers for existing applications where relevant

c) obtained approvals or additional approvals that are required."

Ripley Valley Priority Development Area (RVPDA) Development Scheme

At the Local level, the referral area is located within the RVPDA as part of the Ipswich City Council Local Government Area (LGA), the former of which was declared under the *Urban Land Development Authority Act 2007* (ULDA Act). This legislation supersedes the requirements of Local Government planning provisions (in this case, the *Ipswich City Council Planning Scheme*) and selective other state legislation (e.g., *Vegetation Management Act 1999*, and others).

The ULDA has now been replaced by Economic Development Queensland (EDQ) and the UDA renamed as a Priority Development Area (PDA), with the meaning defined in the *Economic Development Act 2012* (EDQ Act).

The RVPDA development scheme was approved in October 2011 and regulates development within the PDA. The Scheme identifies that the site occurs as wholly 'urban living.' Within the urban living zone of the PDA, residential development is planned for neighbourhoods and focused on accessible centres comprising a mix of residential including houses, multiple residential and other residential and live work opportunities through home-based business.

A development application has been lodged to EDQ for assessment against the RVPDA Development Scheme (4815/2024/PDA), which is being assessed by ICC against EDQ's Implementation Guidelines. Specifically, the applicable guideline is Guideline 14 – Environment and Natural Resource Sustainability (IG14). A Significant Biodiversity Assessment Report (SBAR) has been developed to inform the development application and provide background data and rationale for the development proposal. At present there has been no objection to the development from an environmental perspective and an approval is expected imminently.

Nature Conservation Act 1992

Under the *Nature Conservation Act 1992* (NCA) Protected Plants Flora Trigger Survey Map, the referral area is predominantly mapped as 'High Risk.' Prior to clearing, a flora survey and associated report will be completed in accordance with the Flora Survey Guidelines – Protected Plants provided by the Department of Environment, Tourism, Science, and Innovation (DETSI).

3. Description of the Environment and MNES

This section responds to Item 3 of the PD request which requires the proponent to provide a description of the environment affected by and surrounding the proposed action area, over both the short and long term. Specific matters to which this section addresses are detailed in the following subsections.

3.1. Description of potential MNES that occur on, and adjacent to, the Project

Item 3.1 of the PD Request asks for, ***"A description of the environment more broadly including the previous and current land use within and surrounding the proposed action area".***

Site Context

The referral area is located at Binnies Road, Ripley, Queensland described as Lot 335 on RP814578. The referral area is located within the north-western portion of the RVPDA, approximately 6 kilometres (km) south-east of Ipswich Town Centre, 1.2km north of the Centenary Highway and 1km south of the Cunningham Highway.

Current land use

The referral area is located in a broad landscape that has been subject to extensive historical and contemporary modification. Historically, the surrounding area was used for rural land uses with major roads and high-density developments occurring from 1982. The existing land use of the referral area as vacant bushland is proposed to be changed to residential development as per the planning intent of the region.

Daleys Road adjoins the western boundary of the referral area and has been upgraded to facilitate new developments in the region. Binnies Road, to the south, is to be upgraded following the development approval of the adjacent site. Further west of Daleys Road, an approved development is present (EPBC 2010/5638) with several other EPBC approvals in the broader locality. Major arterial roads, Cunningham Highway and Ripley Road, are present to the north-west and north-east (refer **Plan A3**).

At present, properties to the south of Binnies Road are predominantly vegetated with mapping indicating the majority of these areas as either Category X (non-remnant) or Category C (high-value regrowth). Category B (remnant) vegetation is present further south-west. To the north of the referral area, very few vegetated areas remain and are confined to waterways.

Topography and soils

The referral area is on a gentle south facing slope at 50m AHD in the southern portion of the site and 65m AHD in the northern portion of the site (refer **Plan A5**). The site is mapped as having Sodosol soils under the Australian Soil Classification (ASC) which are generally found in poorly drained sites with low agricultural potential and have low to moderate chemical fertility (refer **Plan A6**).

Vegetation Communities

The referral area is mapped as predominantly Category B (remnant) RE12.9-10.2 with composite RE12.9-10.2/12.9-10.7/12.9-10.16 associated with a small area of mapped regrowth vegetation. Field surveys identified vegetation across the referral area to be consistent with eucalypt woodland with indicator species of RE12.9-10.2 throughout. RE12.9-10.2 is widespread in the region and categorised as *Corymbia citriodora* (Spotted Gum) dominant. A constructed dam and associated areas of high disturbance were observed in the south. Despite the referral area being mapped as remnant vegetation, evidence of historical selective logging was observed during field surveys resulting in relatively few mature trees than would be typical in this community. Additionally, hollow bearing trees were sparse which often form in large mature trees further indicating historical selective clearing. Given the highly modified nature of the surrounding area, weed incursion was observed in the south and along the property boundaries.

No evidence of Of Concern RE12.9-10.16 in the form of araucarian microphyll to notophyll vine forest was observed within the referral area (refer **Plan A7**).

AU1 – Eucalypt woodland indicative of RE12.9-10.2

Vegetation across the referral area is generally consistent with the RE mapping of 12.9-10.2 consisting of *Eucalypt* and *Corymbia* species dominated by *Corymbia citriodora* (Spotted Gum) with *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus melanophloia* (Silver-leaved Ironbark), and *Eucalyptus tereticornis* (Forest Red Gum). The shrub layer contains largely native species including *Alphitonia excelsa* (Soap Tree) and *Acacia sp.* with sparse patches of introduced species including *Lantana camara* (Lantana). The ground layer was observed to be variable throughout the referral area, with some areas dominated by leaf litter, other areas dominated by native species including *Entolasia stricta* (Wiry Panic), and *Cymbopogon refractus* (Barbed Wire Grass) and patches of introduced species including *Lantana montevidensis* (Creeping Lantana) (refer **Photo set 1**).

Additionally, this remnant vegetation is intersected by two eroded drainage features originating from culverts to the north of the referral area and extending to the southern boundary where they merge into a low-lying area with standing water and *Typha orientalis* (Broad-leaved Cumbungi) present.





Photo set 1: Eucalypt dominated (RE12.9-10.2) remnant vegetation within the referral area.

Balance

A small area in the south of the referral area displayed significant disturbance from historical clearing and edge effects. Regrowth vegetation was more dominant in this area with a small, constructed dam present (refer **Photo set 2**).



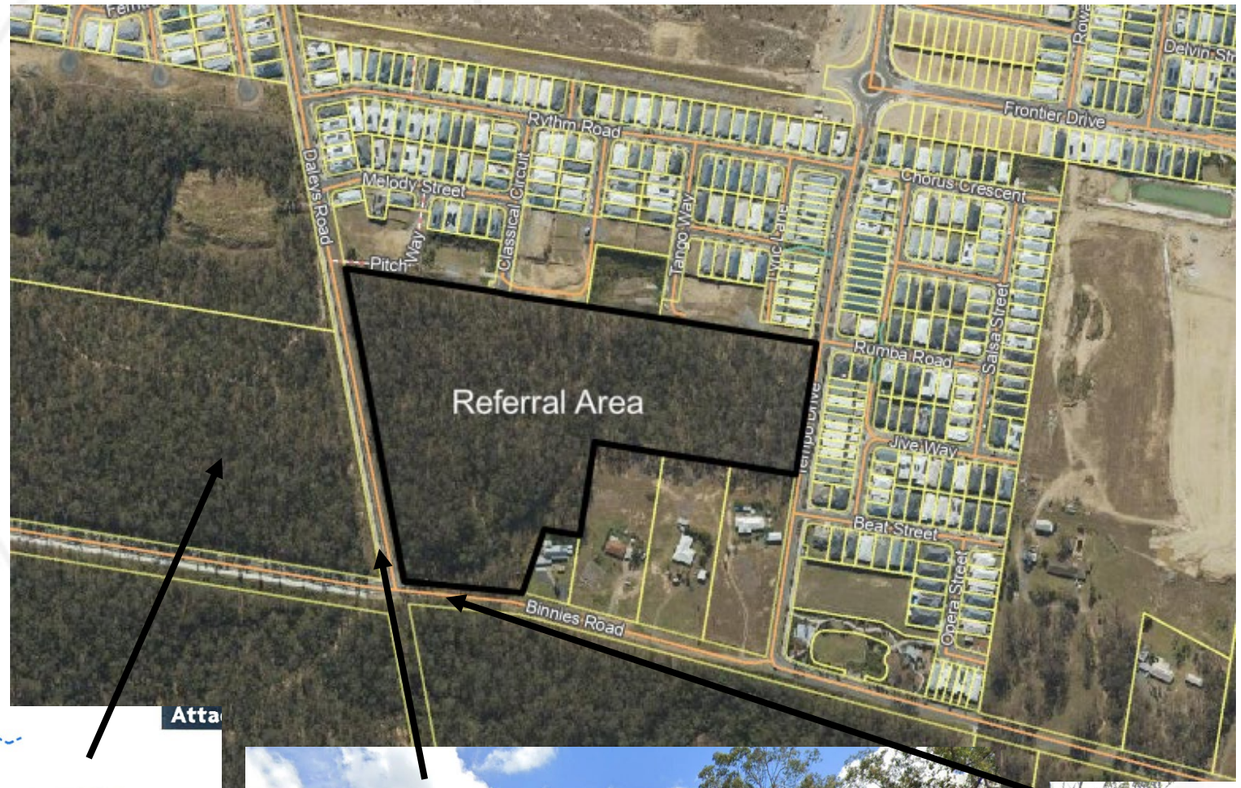
Photo set 2: Highly disturbed vegetation dominated by weeds and regrowth in the south-eastern extents of the referral area.

Habitat Connectivity

The referral area is significantly fragmented from surrounding vegetation patches by existing and ongoing staged development, including EPBC Act approved residential developments (refer **Plan A3**). Current fragmentation of the landscape is demonstrated in **Insert A1** and can be summarised as:

- Properties adjoining the eastern and northern boundaries of the referral area have been cleared and are currently being developed with low density housing.
- The property adjoining the western boundary has all necessary approvals and is in the process of staged development. It received a not controlled action decision in December 2010 which included upgrading the section of Binnies Road along its southern boundary and development of most of the site, including all land along the eastern boundary.
- Daleys Road is situated between the referral area and the western property including a two-way road and large pedestrian track. Construction of the road and associated clearing has created a 30m gap to the remaining vegetation on the western property. This vegetation will be cleared for future approved stages of development.
- The Binnies Road reserve is located adjacent to the southern boundary with areas to the east and west already constructed. The small stretch of road adjacent to the referral area has been cleared of vegetation for several years.
- The property immediately south of Binnies Road has lodged an application for residential development and is currently working through that process. Vegetation on this property has been mapped as 'young to intermediate' by Griffith University (refer to **Plan A22**) therefore is unlikely to provide habitat for some species such as Greater Glider.

In addition, zoning for the RVPDA shows planning intent for the surrounding land is urban living and urban core (**Plan A23**). While this does not mean all land will be in this zoning will be cleared, many areas are already disturbed and are likely to be utilised for future urban development.





Approved masterplan on adjacent property (EPBC 2010/5638)



View of Daleys Road north from Binnies Road (google street view)



View of Binnies Road east from Daleys Road (google street view)

Insert A1: Fragmentation surrounding the referral area

Item 3.2. of the PD Request asks for ***"A description of any potential listed threatened species or ecological community (including but not limited to those listed in this request for information) that occur in the project area and adjacent areas. "***

As part of the original referral material (included in **Part B** of this PD), a Likelihood of Occurrence Assessment was completed for MNES identified in the *EPBC Act* Protected Matters Search as having the potential to occur within 5 km of the referral area.

The likelihood of occurrence is two tiered, first a desktop assessment is conducted to ascertain any local records and potential habitat within the referral area. The result of this assessment drives the field survey methodology where on-ground detail surveys are completed to re-evaluate the likelihood of occurrence assessment. Several species where identified as having the potential to occur based on the desktop assessment. Following field survey several species were downgraded given the lack of suitable habitat.

Table A5 provides an extract of the Likelihood of Occurrence Assessment for Koala, Grey-headed Flying-fox, Regent Honeyeater, White-throated Needletail, South-eastern Glossy Black-Cockatoo, Swift Parrot, Greater Glider and South-eastern Yellow-bellied Glider from **Appendix C** of **Part B** of this PD. This extract has been amended to provide additional detail relevant to the species reviewed and their potential occurrence on-site and on land adjacent to the site.

Further detailed literature review of preferred species habitat and assessment of the site for the additional species identified by the DCCEEW is contained in the sections below, to demonstrate justification as to why the Likelihood of Occurrence Assessment identified these species as highly unlikely to occur.

Table A5: Extract of Likelihood of Occurrence Assessment for relevant MNES from Appendix D of Part B of this PD.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes (DoE, 2016). They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes, particularly in areas with box-ironbark associations, preferring more fertile sites with higher soil water content, more typical of Land Zone 3. They have also been found to prefer large diameter eucalypt trees for foraging as they typically produce more nectar. The Regent Honeyeater's preferred foraging species is *Corymbia maculata* which is primarily found in southern NSW. Similar species, *Corymbia citriodora* and *C. henryi* are more common in south-east Queensland.	**Low** A review of the Atlas of Living Australia (ALA) database confirms that the species has been recorded within 5km of the referral area. Given the critically endangered listing of the species, the record has been assigned a coordinate uncertainty of 2km. The National recovery plan for the regent honeyeater notes that most records of regent honeyeaters come from box-ironbark eucalypt associations, where the species seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. Other forest types regularly utilised by regent honeyeaters include wet lowland coastal forest dominated by swamp mahogany (*Eucalyptus robusta*), spotted gum-ironbark associations and riverine woodlands. The referral area does not contain any waterways or wet lowland forest that would provide critical habitat for the species. The recovery plan also lists key tree and mistletoe species for the regent honeyeater, which include Yellow Gum (*E. leucoxylon*); Mugga Ironbark (*E. sideroxylon*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Spotted Gum (*Corymbia maculata*); Needle-leaf Mistletoe (*Amyema cambagei*) on River Sheoak; Box Mistletoe (*A. miquelii*); and Long-flower Mistletoe (*Dendropthoe vitellina*). None of these species were identified in the referral area. In addition to preferred habitat, the recovery plan also identifies key areas regularly used by regent honeyeaters as habitat critical to the species survival. Regularly used areas include Bundarra-Barraba, Hunter Valley, Capertee Valley and Chiltern. All of these areas are located several hundred kilometres from the referral area.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
				The recovery plan states that mature, large individual trees tend to be more important as they are more productive, particularly on highly fertile sites and in riparian areas. As previously noted, the referral area does not contain any waterways or riparian areas. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38, therefore would not be considered high value habitat for regent honeyeater. No mistletoe was observed on site. Additionally, Regent Honeyeaters experience competition from aggressive species such as Noisy Miner (*Manorina melanocephala)*. Noisy Miners were observed within the referral area on multiple occasions reducing the likelihood potential for Regent Honeyeaters to opportunistically forage on-site. A combination of a lack of local records, limited foraging resources and small overall impact area concludes that the proposed development is highly unlikely to have a significant impact in the species.
Calyptorhynchus lathami lathami	South-east Glossy Black-cockatoo	Vulnerable	This species prefers woodland areas dominated by she-oak Allocasuarina, or open sclerophyll forests and woodlands with a stratum of Allocasuarina beneath Eucalyptus, Corymbia or Angophora. Glossy black-cockatoos have also been observed in mixed Allocasuarina, Casuarina, cypress Callitris and brigalow *Acacia harpophylla* woodland assemblages. West of the Great Dividing Range, they have been observed feeding in	**Low** The South-eastern Glossy Black-cockatoo relies on two specific habitat types for foraging and breeding. Foraging habitat is defined as vegetation containing Casuarina or Allocasuarina species. In Southeast Queensland these are usually *Allocasuarina littoralis* (Black She-oak) and *Allocasuarina torulosa* (Forest She-oak). The South-eastern Glossy Black-cockatoo is known to be highly selective of individual feed trees, and a dense subcanopy of Casuarina or Allocasuarina species is required to provide suitable foraging habitat. Breeding habitat is understood to be equally selective with a preference for specific hollow characteristics, notably a minimum entrance diameter >15cm.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
			remnant belah *Casuarina cristata* and bulloak *Allocasuarina luehmannii* forests. This species is also known to utilise appropriate remnant woodlands, and individual or small pockets of Allocasuarina and Casuarina feed trees in urban areas.	The referral area contains eucalypt woodland dominated by *Corymbia citriodora* (Spotted Gum) with *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum). While the sub-canopy contains native species, it only contains sparse individuals and small groupings of Allocasuarina specimens all of which are *Allocasuarina luehmannii* (buloke). The two MHQ transects completed only encountered one individual within the 4,000m^2 area surveyed. This equates to 2.5 individuals per hectare. In addition to the low density of food sources on site, EPBC Act conservation advice for the South-east Glossy Black-cockatoo states that Buloke is not considered a preferred feeding species in southeast Queensland where they are usually observed feeding on black sheoak and forest sheoak, although there are also records of them feeding on stringybark sheoak (*A. inophloia*), coastal sheoak (*C. equisetifolia*), and to a lesser extent river sheoak (*C. cunninghamiana*) and swamp sheoak (*C. glauca*) during limited times of the year. They have only been identified using buloke in western NSW, although it is still not considered an important food species in that region. The South-east Glossy Black-cockatoo has been observed nesting in *Eucalyptus crebra* (Narrow-leaved Ironbark) in central NSW however most nests have been located within 1km of their primary feed tree species. The referral area does not contain primary food trees, there are no recorded observations within 5 km of the site and much of the land to the north, east and west has been cleared for urban development. Only two hollows were identified in living trees within the referral area.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
				It is therefore considered highly unlikely that the species would utilise the referral area as foraging or breeding habitat. There are no records of the species within 5km of the site with the nearest records being approximately 9km east. These records are both dated (1975) with the nearest contemporary records approximately 11.5km east, associated with White Rock Conservation Park.
Lathamus discolour	Swift Parrot	Critically Endangered	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations.	**Low** The Swift Parrot is migratory, breeding in Tasmania and moving to mainland Australia for non-breeding season (usually arriving between February and March), with most of the population wintering in Victoria and New South Wales, with smaller numbers reaching south-east Queensland, Australian Capital Territory and south-east South Australia, returning to Tasmania September to October (Survey guidelines for Australia's Threatened Birds). The National Recovery Plan (2024) for the Swift Parrot identifies preferred foraging species on the mainland as Yellow Gum (*E. leucoxylon*); Red Ironbark (*E. tricarpa*); Mugga Ironbark (*E. sideroxylon*); Grey Box (*E. macrocarpa*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Forest Red Gum (*E. tereticornis*); Blackbutt (*E. pilularis*); and Spotted Gum (*Corymbia maculata*). Swift Parrots also preferentially forage in large, mature trees that provide more reliable foraging resources than younger trees. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38. In addition to the lack of mature trees, only 5 of the 74 large trees located on site were preferred foraging species for swift parrot, being *E. tereticornis*.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
				The species has not been recorded within 5 km of the site with the closest record approximately 8 km west of the referral area. Given this species is Critically Endangered, the location of recorded sightings are generalised to 10km. The National Recovery Plan (2024) lists 18 Key Biodiversity Areas (KBAs) for the swift parrot spread throughout New South Wales, Victoria and Tasmania. No KBAs are located in Queensland, highlighting that key habitat areas for this species are located south of the Queensland border. The small size of the referral area (7.52 ha), lack of preferred foraging habitat and limited recorded sightings anywhere near the site indicates that it is highly unlikely that the referral area would be utilised by Swift Parrots.
Petauroides volans	Greater Glider	Vulnerable	The Greater Glider is a nocturnal gliding marsupial with a broad distribution throughout mainland eastern Australia, mostly restricted to eucalypt forests and woodlands with abundant (large) hollow-bearing trees for shelter and a variety of eucalypt species for feeding. Diet consists of eucalypt leaves, and occasionally flowers. Six tree species were identified as dominant or co-dominant species to the majority of greater glider habitat; *Corymbia citriodora, Eucalyptus moluccana, E. tereticornis, E. crebra, C. intermedia* and *E. portuensis*. Additionally, a list of 503 regional ecosystems with a known or possible association with Queensland 'Guide to	**Unlikely** The Greater Glider is largely restricted to eucalypt forests and woodlands of eastern Australia. It is typically found in highest abundance in taller, montane, moist eucalypt forests on fertile soils, with relatively old trees and abundant hollows associated with Category B (remnant) vegetation. While the referral area does contain mapped Category B (remnant) vegetation of eucalypt dominated communities, on-ground assessments observed minimal levels of hollow-bearing trees and therefore limited suitable shelter habitat exists. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38. A total of 9 hollow-bearing trees were recorded, 7 of which are dead/stag trees. This represents approximately 1.19 hollow bearing trees per hectare which is well below the 2-4 hollows per 2 hectare required by the species. Furthermore, the species has a preference for living hollows of which only 2 trees were recorded.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
			Greater Glider Habitat in Queensland' (DES 2022). Habitat identified as critical habitat in the Conservation Advice for Petauroides volans (DCCEEW, 2022) can be described as: • large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region; and • smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonisation; and • cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and • areas identified as refuges under future climate changes scenarios; and • short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes)	The referral area is also situated within neighbouring established and emerging residential development resulting in high levels of disturbance. Nocturnal surveys (spotlighting) were conducted across the referral area on two separate nights. No evidence of Greater Glider sightings has been recorded by the ALA within 5 km of the referral area and no activity was recorded within the referral area. The evidence suggests that the referral area is not currently utilised by Greater Glider and is considered poor habitat for the species. As stated in the Conservation Advice for *Petauroides volans* (Greater Glider (southern and central)) 2022, the species is particularly sensitive to disturbance associated with forest clearance and fragmentation and disperse poorly. The referral area is located in a landscape that has been partially subject to modification for past and on-going land-uses resulting in a mixture of undisturbed and highly disturbed environments. The referral area lacks suitable habitat for the species, retains extremely limited connectivity potential and is located adjacent to highly modified areas.

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
			that allow the species to persist, recover and recolonise burnt areas.	
Petaurus australis australis	South-eastern Yellow-bellied Glider	Vulnerable	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Den, often in family groups, in hollows of large trees. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	**Unlikely** The South-eastern Yellow-bellied Glider occur in tall mature eucalypt forest and den, often in family groups, in hollows of large trees usually more than one metre in diameter. The species is very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources. The referral area is mapped as containing remnant vegetation, however on-ground field surveys identified that the vegetation retained minimal mature specimens. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38. Only 9 trees were observed as containing hollows (7 of which are dead/stag trees). The referral area consists of a 7.52 ha patch with significantly limited habitat connectivity as a result of current residential developments and roads. There are no records of the species within the locality, with the majority of the records present approximately 15-20km east of the site. The species was not observed within the referral area despite multiple targeted searches. Evidence of the species in the form of characteristic V-shaped cuts were also not observed during detailed individual tree surveys.
Phascolarctos cinereus	Koala	Endangered	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	**Moderate** The Koala occurs in a range of environments containing eucalypt forest or woodland. The referral area does support habitat for the species associated with remnant and regrowth eucalypt dominated vegetation. Spot Assessment Technique (SAT) surveys were utilised to detect evidence of Koala activity across

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
				the referral area and to determine the likelihood of occurrence on-site. Five (5) SATs were carried out across the referral area which involves searching the base of the nearest 30 trees to a central point for scats. Evidence of Koala activity in the form of scats was recorded within the referral area (SAT 2, 2 out of 30 trees), indicating a 'low use' of the referral area by the species. However, no direct observations of Koala were recorded within the referral area. The species is known to be present within the locality and Koala habitat was confirmed within the referral area. The referral area retains minimal connectivity value to the north, west and east by current roads and residential developments. Marginal connectivity value is present to the south although consideration needs to be given to the expected upgrade of Binnies road and development of land holdings to the south. Notably, evidence of predatory species (Dog, Fox and Cat) was observed within the referral area and adjoining.
Pteropus poliocephalus	Grey-headed Flying Fox	Vulnerable	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops. The primary food source is blossom from *Eucalyptus sp*. and related genera.	**Moderate** *Pteropus poliocephalus* (Grey-headed Flying-fox) requires foraging resources and roosting sites to persist. The species is known to use a wide variety of habitats including subtropical and temperate rainforests, tall sclerophyll forest and woodlands, heaths, swamps and also urban and agricultural areas where food trees have been cultivated. The species is highly adaptive with its diverse native diet, which it can supplement with introduced species. It is known to forage within a variety of habitat areas as each resource does not produce food throughout the entire year. No Grey-headed Flying-fox roosts were observed within the referral area. A review of the National Flying-fox monitoring viewer identified a GHFF roost approximately 2.5km north-east of the site (Yamanto (479)). The nearest roost of national significance (Inala, Lilac Street (1219)) is located approximately 21.5 km north-east of the site. Given

Species	Common Name	Status	Description of Community / Habitat	Likelihood of Occurrence
				the availability of suitable foraging habitat within the broader area, it is considered unlikely that the species would utilise the relatively small area of 7.52 ha associated with the referral area.
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.	**Low** The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. The referral area contains wooded areas including open forests. A review of Queensland WildNet and ALA identified several records of the species within 5km of the site within the last 5 years. Mapped remnant vegetation is present over the majority of the site however field surveys identified that the majority of the vegetation displays evidence of disturbance from historical land-uses and thus does not resemble old growth forest. Although the species has been observed within close proximity to the referral area and potential habitat was observed throughout the remnant vegetation on-site, the minimal number of hollow-bearing trees suitable for breeding and the species highly mobile state indicates the unlikeliness to occur within the referral area during roosting periods.

3.2. Field Survey Effort

Item 3.4 of the PD Request asks for ***'Up to date baseline and survey data at the impact site(s), and if relevant, the proposed offset site(s) site, including:***

a. Information on the survey methodology or technique used (e.g., thermal image detection, dog detection, eDNA methods, camera trapping, tree hollow search, SAT surveys etc)
b. When surveys were conducted (e.g., dates, time of day, season, etc.) and survey effort (e.g., two hours for every one hectare within a 5-hectare area)
c. Map/s of survey points or transects and how the survey points or transects were selected.
d. An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.
e. Results of all surveys undertaken.

This PD provides all literature reviewed and cited within a reference list. The source of survey methods, guidelines and historical records are also provided. All survey methods undertaken have been guided by best practice and where applicable, Commonwealth and State survey guidelines for threatened species. This includes the following methodologies:

- *Survey guidelines for Australia's threatened bats.*
- *Terrestrial Vertebrate Fauna Survey Guidelines.*
- *Survey Guidelines for Australia's Threatened Mammals.*
- *EPBC Act significant impact guidelines*

Ecological field surveys were completed across the referral area in the attempt to confirm presence of potential MNES. Fauna surveys were conducted under the following permits held by SHG:

- Scientific Purposes Permit **P-SPP-100794835** granted under Research / Education Application issued under the provisions of the Nature Conservation (Animals) Regulation 2020
- Department of Agriculture and Fisheries (DAF) Ethics clearance **CA 2020/02/1355**
- Scientific User Registration **SUR000451**

3.2.1 Desktop Analysis

Prior to the commencement of field surveys, a desktop analysis was conducted of Commonwealth, State and Local environmental databases and overlay mapping to identify potential MNES and included the following:

- Commonwealth MNES protected under the EPBC Act on and around the referral area using the protected matters search tool with a 5 km radius
- *Nature Conservation Act 1992* (NCA) listed threatened species on and around the referral area using the wildlife online database search tool with a 5 km radius
- Public environmental databases including Atlas of Living Australia and BioMaps;

- State regulated vegetation management and vegetation supporting maps under the VMA including essential habitat mapping; and
- Local government records where MNES threatened species and communities are known to occur in the area.

Additionally, a review of aerial photography history was undertaken via QImagery to assist with the broad delineation of vegetation communities and to determine historical patterns to local vegetation communities.

3.2.2 MNES Surveys

Field surveys utilising the methods outlined in the following subsections and **Part B Referral MNES Report Section 3.2** were conducted to describe ecological value of the referral area (refer **Plan A14** for summary of contemporary field surveys and Part B MNES Report). Field surveys were undertaken during seasonal conditions generally favourable to the detection and identification of flora and fauna species. Field survey methods were determined based on target species and communities and EPBC Act listed species guidelines. Initial field surveys for EPBC referral were completed during February 2024 (**Part B MNES Report**). These surveys involved the following:

- Validation of desktop findings;
- Verification of the floristic structure and composition of vegetation communities present;
- Fauna surveys including diurnal bird surveys, nocturnal searches (spotlighting), camera trap deployment, and targeted searches for conservation-significant species include Koala SATs;
- Describing the fauna habitat present and recording any incidental fauna sightings;
- Identifying weed species and documenting vegetation disturbance; and
- Assessment of the ecological values on site with respect to the mapped environmental values on the site.

Contemporary targeted MNES flora and fauna surveys were undertaken on 1, 14, 15 February and 12 August 2024, during relatively warm conditions with no rainfall recorded within the locality (<0 mm rainfall recorded, BOM 2024) (refer **Table A6**). Over 58 person hours have been spent completing surveys across the referral area as well as 14 days of remote fauna camera traps by suitably qualified Ecologists (refer **Table A7**). Consideration was also given to the ecological significance of the referral area in the context of the local area and the broader region. No specific surveys for reptiles (e.g. pitfall traps) were undertaken during field surveys. The results of these surveys are detailed in Part B.

Table A6: Contemporary Field Survey Methods Summary

Date	Weather Conditions	Methods
1 February 2024	20.7°C min – 32.1°C max, 0 mm rainfall	- General observational surveys - Context analysis - Camera deployment - Spot Assessment Technique surveys.
14 February 2024	19.5°C min – 33.5°C max, 0 mm rainfall	- General observational surveys - Tree plot of large and hollow bearing trees - Dusk bird survey - Spotlighting.
15 February 2024	23.1°C min – 30.9°C max, 0 mm rainfall	- General observational surveys - Camera collection - Dusk bird surveys - Spotlighting
12 August 2024	14.4°C min – 20.3°C max, 5.8 mm rainfall	- General observational surveys - Modified Habitat Quality Assessments - Spot Assessment Techniques

Source: *Combination of Amberely (040004) and Greenbank (Defence) QLD (140009), BOM 2024.*

Table A7: Survey guidelines and field personnel

Scientific Name	Common Name	Survey guidelines	Techniques Implemented and survey effort	Field personnel qualifications
Phascolarctos cinereus	Koala	*Survey guidelines for Australia's threatened mammals* Phillips and Callaghan (2011)	• Four (4) Spot Assessment Technique survey • Two (2) scat meanders • Assessment of foraging and breeding values (habitat suitability) • Motion fauna camera	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Environmental Management (Natural Systems and Wildlife) **Senior Ecologist** • 4 years of relevant experience • Bachelor of Science (Ecology and Conservation Biology **Ecologist** • 2 years of relevant experience • Bachelor of Science (Ecology and Zoology)
Pteropus poliocephalus	Grey-Headed Flying-Fox	*Survey guidelines for Australia's threatened bats*	• Assessment of habitat • Nocturnal searches	
Petauroides volans, Petaurus australis australis	Greater Glider and South-eastern Yellow-bellied Glider	*Survey guidelines for Australia's threatened mammals*	• Assessment of habitat for foraging or breeding • Nocturnal active searches • Searches of indirect evidence	
Calyptorhynchus lathami lathami, Anthochaera Phrygia, Lathamus discolor	South-eastern Glossy Black-cockatoo Regent Honey-eater Swift Parrot	*Survey guidelines for Australia's threatened birds*	• Assessment of habitat	

Incidental surveys (diurnal)

The referral area was walked to ensure all species (flora and fauna) were recorded and identified. Particular attention was paid to any threatened species that were listed as possibly occurring on or within the vicinity of the application area and specific micro-assemblages which may support these threatened species. This included observations for vertebrate fauna present on or that may utilise the study area, including faunal lists and significance status of species under the EPBC Act including the JAMBA, CAMBA, ROKAMBA and the Bonn Convention, and Queensland's NCA.

The incidental survey included identification of ecological features and values such as broad vegetation communities, fauna habitats and contextual assessment. Incidental surveys included observing a recording flora and fauna species through either direct observation or indirect evidence (calls, tracks, scats)

Motion Detection Camera

A total of four (4) baited camera traps were installed within the referral area for a period of 14 nights each. The cameras were deployed on 1 February 2024 and removed 15 February 2024. The camera was fixed to a tree approximately 70 cm from the ground and 100-150 cm in front of a bait station containing a peanut butter and oat mixture (universal bait type). Following the deployment, the camera images were analysed with all species identified subsequently added to the referral area fauna list.

Spot Assessment Technique

Tools for determining localised levels of use by *Phascolarctos cinereus* (Koala) included the Spot Assessment Technique (SAT), scat meanders, as well as direct observations for Koala and Koala activity throughout the field survey period. These surveys were completed in February and August 2024. Additional general observations and habitat features across the referral area were also recorded. SAT surveys were undertaken in accordance with the methodology developed by the AKF and specified in the EPBC Act Referral Guidance for the Endangered Koala (specifically, the *Survey Guidelines for Australia's Threatened Mammals* was incorporated where relevant).

The SAT method is an assessment of Koala activity involving a search for any Koalas and / or signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the referral area that is either observed to have a Koala or scats or is known to be a food tree or otherwise important for Koalas and recording any evidence of Koala usage of that tree including presence, identifiable scratches or scats. The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed. Assessment of each tree involves a systematic search for Koala scats beneath the tree within one metre radius of the trunk. After approximately two minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala. The number of trees showing evidence of Koala activity is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage.

Three (3) SAT surveys were conducted across the site in February 2024 (**Part B MNES Report**) with another (2) two (2) SAT surveys completed in August 2024.

Nocturnal Spotlighting

This non-intrusive technique is the most effective method to obtain estimates of nocturnal arboreal mammal incidence and abundance in wooded habitats. Spotlighting also targets medium to large terrestrial nocturnal mammals, and can detect other nocturnal taxon groups (e.g. frogs, geckoes, nocturnal snakes, nocturnal birds, spiders).

Spotlight searches were conducted over the course of two nights (31 October and 1 November 2023) from 1800hrs to 2100hrs by two ecologists. High-powered spotlights (Fenix HP25R Rechargeable LED Headlamp – 1000 lumens) were used to detect cryptic and nocturnal fauna. Site access via foot was preferred (vehicle access was not possible). A total of 12 person hours of spotlighting meanders were completed across the referral area. Nocturnal spotlighting surveys did not detect any MNES or conservation significant species across the site over the two-night survey period.

Modified Habitat Quality Assessment

The Modified Habitat Quality Assessment (MHQA) methodology was utilised to assess the referral area condition, site context and species stocking rate. Refer to **Section 4** for more detail on methodology.

The referral area was recognised as a single assessment unit (AU). In order to determine the quantum and quality of the habitat suitable for koala within the referral area, vegetation/habitat quality was derived from the Modified Habitat Quality Assessment tool.

Habitat tree survey

All trees >380mm DBH, which is considered the threshold for large trees in the regional ecosystem present on site (12.9-10.2), and hollow-bearing trees were recorded across the referral area by experienced Ecologists. Both dead and alive trees were recorded where necessary. Hollow sizes were recorded to provide specific suitability assessments (e.g. Greater Glider and South-eastern Glossy Black-cockatoo require larger hollows).

Hollows were separated into the following size categories:

- Small (0-99 mm diameter),
- Medium (100-299 mm diameter) and
- Large (>300 mm diameter).

Bird survey

In addition to incidental surveys occurring across the referral area, point surveys were completed at dusk on two (2) separate days. Dusk surveys are completed when bird activity is typically high to allow for maximum detection effort. Birds are recorded by either visual identification or call.

Refer **Plan A14** for field survey effort

3.3. Field survey results

3.3.1 Vegetation Communities and Assessment Units

The following sections discuss the results of the contemporary field verification surveys of vegetation communities within the referral area. On-ground vegetation characteristics were utilised to delineate vegetation communities and assessment units. Initial field surveys (refer **Part B MNES Report**) identified two (2) vegetation communities within the referral area.

Eucalypt woodland indicative of RE12.9-10.2 (7.18 ha)

The majority of the referral area contains eucalypt woodland which is generally consistent with the RE mapping of 12.9-10.2 consisting of *Eucalypt* and *Corymbia* species dominated by *Corymbia citriodora* (Spotted Gum) with *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus melanophloia* (Silver-leaved Ironbark), and *Eucalyptus tereticornis* (Forest Red Gum). The shrub layer contains largely native species including *Alphitonia excelsa* (Soap Tree) and *Acacia sp.* with sparse patches of introduced species including *Lantana camara* (Lantana). This RE is described in **Table A8**.

Highly disturbed area (0.20 ha)

The referral area is mapped as containing Category X (non-remnant) vegetation in the southern extent. This section of the referral area displayed significant disturbance as a result of historical land clearing. The Category X (non-remnant) vegetation is located adjacent to the neighbouring lot where maintained lawn, overgrown exotic grass sp. and regrowth is present. Pre-clear mapping indicates this non-remnant area consists of a composite RE 12.9-10.2/12.9-10.7/12.9-10.16. A summary of the preclear mapped Regional Ecosystems is provided in **Table A8**.

The variance in quality of habitat on an impact or offset site is accounted for by delineating sites into assessment units (AUs). AUs are mapped to determine where the sample sites will be and how many are required to adequately assess the site's condition. AUs can be defined using desktop information but can be refined during field surveys where appropriate. In general, they should be relatively homogenous, defined by a distinct regional ecosystem or habitat type and distinct from other patches of vegetation on the site. For the purposes of this assessment, the referral area was recognised as a single assessment unit with vegetation community two considered part of AU1.

Table A8: Assessment unit within referral area

Assessment Unit	VMA Category	Vegetation Status	Regional Ecosystem	Area (ha)
AU1	Mostly Category B	Remnant	Least Concern RE12.9-10.2	7.52

3.3.2 Koala occurrence surveys and results

Three (3) SAT surveys were conducted across the referral area in February 2024 (**Part B MNES Report**) with another (2) two (2) SAT surveys completed in August 2024 with all returning a 'low or no use' for the Koala (*i.e.*, between 0.00% and 10% of the trees surveyed had Koala scats) in accordance with the East Coast (med-high)

benchmark described by Phillips and Callaghan (2011). Results of SAT are summarised in **Table A10**. Raw SAT survey data is provided in **Attachment A4**.

Koala stocking rate scores are calculated using the SAT activity categories taken from the Australian Koala Foundation Koala activity level classification table by Phillips & Callaghan (2011) (refer **Table A9**).

Table A9: Koala Activity Level Classification (Phillips and Callaghan 2011)

Usage	East Coastal (low)	East Coastal (med-high)	Western (med-high)
Low	<9.5%	<22.5%	<35.8
Moderate	9.5-12.6%	22.5-32.8%	35.8-46.7
High	>12.6%	>32.8	>46.7

Categories are assigned as follows:

- Sites considered to be suitable or have high suitability for Koalas are assigned the East Coastal (med-high) category;
- Sites considered to have low suitability are assigned the East Coastal (low) category; and
- The Western category does not apply to South East Queensland Local Government Areas.

Table A10: Summary of SAT Results

SAT Site Number	SAT Score	Evidence of Koala Use (%)	Koala Use (High/Medium/Low/No)
SAT 1 (01.02.2024)	0/30	0%	No use
SAT 2 (01.02.2024)	2/30	6.67%	Low
SAT 3 (01.02.2024)	0/30	0%	No use
SAT 4 (12.08.2024)	0/30	0%	No use
SAT 5 (12.08.2024)	0/30	0%	No use

3.3.3 Fauna assessment results

Fauna species were recorded by utilising several different survey techniques as described in **Section 3.2.2**. All fauna species recorded are considered common to the local area and where predominantly defined as avi-fauna. Given the isolation of the referral area by roads and developments, it is expected that fauna are limited. Refer **Table A12** for complete fauna list and detection method.

3.3.4 Habitat Tree Plot

Hollow bearing trees were observed to be limited with only nine (9) recorded. Notably, seven (7) of these hollow bearing trees were dead/stag trees which form hollows quicker. Therefore, the density of hollows on-site is 1.19 hollows per ha however only 0.26 living hollows per ha. The lack of hollow bearing trees reflects that lack of mature specimens across the referral area. Trees of a DBH >380 mm including dead stags were



recorded across the referral area and observed to be of low abundance (<10 large trees per ha - refer **Plan A15**). Further detailed assessments of the vegetation condition were utilised to compare against the benchmark values for RE12.9-10.2. The benchmark for number of large trees per hectare for RE12.9-10.2 is 38, measured at 380 mm DBH or greater. As such, the vegetation community within the referral area is approximately a quarter of the large tree benchmark for RE12.9-10.2.

3.3.5 Assessment of Survey Adequacy

Koala

Overall, across the survey period (February and August 2024) a combination of survey methodologies to detect the presence of Koalas onsite were utilised. These included opportunistic daytime searches, activity SAT surveys, spotlighting, deployment of motion sensing cameras and habitat assessment. The survey effort from 2024 included four (4) daytime targeted survey periods and two (2) targeted nocturnal surveys. It is anticipated the combination of these methodologies, which were undertaken in accordance with departmental survey guidelines, provides an adequate survey effort across the site to determine the presence / absence of Koala. Specifically, SAT surveys and targeted Koala surveys were applied to search the referral area for the potential presence of the Koala were completed over two separate survey events.

Grey-headed Flying Fox

Spotlighting surveys were completed over two nights in February 2024 with two observers in accordance with the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022). Targeted surveys covered the entire referral area, no Grey-headed Flying-fox individuals were identified foraging within the referral area and no roosts were identified.

Gliders

Species-specific field surveys for determining species presence and habitat suitable for the greater and yellow-bellied gliders were undertaken over 4-days of field surveys. Diurnal surveys included the locating and identifying of hollow bearing trees and large mature trees. As Greater Gliders require hollow-bearing trees for denning, large trees are considered a suitable proxy for potential habitat as these trees have the potential for forming denning resources into the future (Eyre and Smith *et al.* 2022). Conservation advice for the yellow-bellied glider also identifies their preference for sheltering in large mature usually greater than 1 m DBH.

Nocturnal surveys were also completed focussed on the direct detection of Glider species. The greater glider has a high detection rate utilising spotlighting surveys due to bright eye shine and low mobility. Yellow-bellied glider can be difficult to detect using spotlighting therefore transects were walked to also listen for vocalisation during surveys. Due to the small size of the referral area, two observers were able to walk the entire area during each survey period.

Research into the effectiveness of spotlighting in detection for Greater Glider indicated that where the species is present and sufficient survey effort has been given, detection is highly likely (Eyre 2006, Lindenmayer et al. 2001a; Kavanagh 1984). Targeted Glider surveys involved spotlighting on-foot by two (2) SHG ecologists for as per recommended survey guidelines (**Plan A14** and **Table A11**).

It is considered that the survey effort, timing, and equipment used was appropriate for surveying for Gliders and was undertaken suitably in accordance with the relevant survey guidelines discussed above. Considering that studies have shown that detection of the species is highly likely where sufficient spotlighting survey effort has occurred and the species is present, it is therefore a low likelihood the species is present within the referral area.

Table A11: Glider Survey Guidelines compared to SHG Survey Effort

Transect	Date	Time	Duration	Observers	Distance
Transect 1	14th February 2024	6:30 pm – 9:30 pm	180 minutes	Two (360-person minutes)	3.11 km
Transect 2	15th February 2024	6:30 pm – 9:30 pm	180 minutes	Two (360 person minutes)	2.76 km
Total	N /A	N/A	360 two-person minutes	620 person minutes	5.87 km
Survey Guidelines (Queensland)			30-person minutes		100 m x 100 m survey site, 100 m per transect

Table A12: Recorded fauna within the referral area

Scientific Name	Common Name	Diurnal survey	Spotlighting		Camera locations				Native/exotic
			Night 1 (14.02.2024)	Night 2 (15.02.2024)	Camera 1 (crab)	Camera 2 (duck)	Camera 3 (iris)	Camera 4 (possum)	
BIRDS									
Acridotheres tristis	Indian Myna	x							Exotic
Chenonetta jubata	Australian Wood Duck	x							Native
Corvus orru	Torresian Crow	x							Native
Dacelo novaeguineae	Laughing Kookaburra	x				x			Native
Dicrurus bracteatus	Spangled Drongo	x							Native
Entomyzon cyanotis	Blue-faced Honeyeater	x							Native
Eolophus roseicapilla	Galah	x							Native
Geopelia striata	Peaceful Dove	x			x				Native
Grallina cyanoleuca	Magpie-lark	x			x				Native
Gymnorhina tibicen	Australian Magpie	x				x			Native
Manorina melanocephala	Noisy Miner	x							Native

Scientific Name	Common Name	Diurnal survey	Spotlighting		Camera locations				Native/exotic
			Night 1 (14.02.2024)	Night 2 (15.02.2024)	Camera 1 (crab)	Camera 2 (duck)	Camera 3 (iris)	Camera 4 (possum)	
Meliphaga lewinii	Lewin's Honey Eater	x							
Phaps chalcoptera	Common Bronzewing	x							Native
Podargus strigoides	Tawny Frogmouth	x	x	x					Native
Rhipidura leucophrys	Willie Wagtail	x			x				Native
Strepera graculina	Pied Currawong	x							Native
Todiramphus sanctus	Sacred Kingfisher	x							Native
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	x							Native
Trichoglossus haematodus moluccanus	Rainbow Lorikeet	x							Native
Vanellus miles	Masked Lapwing	x							Native
MAMMALS									
Canis lupus familiaris	Domestic Dog	x							Exotic
Felis catus	Cat					x			Exotic
Lepus europaeus	Hare	x			x				Exotic

Scientific Name	Common Name	Diurnal survey	Spotlighting		Camera locations				Native/exotic
			Night 1 (14.02.2024)	Night 2 (15.02.2024)	Camera 1 (crab)	Camera 2 (duck)	Camera 3 (iris)	Camera 4 (possum)	
Macropus giganteus	Eastern Grey Kangaroo	x			x	x		x	Native
Macropus rufogriseus	Red-necked Wallaby		x		x	x			Native
Mus musculus	Field Mouse				x			x	Exotic
Perameles nasuta	Long-nosed Bandicoot							x	Native
Phascogale tapoatafa	Brush-tailed Phascogale				x			x	Native
Pteropus alecto	Black Flying-fox			x					Native
Trichosurus vulpecula	Common Brushtail Possum		x	x		x			Native
Vulpes vulpes	Red Fox					x	x	x	Exotic
REPTILES									
Intellagama lesueurii	Australian Water Dragon	x			x				Native
Pogona barbata	Bearded Dragon	x							Native
AMPHIBIANS									
Rhinella marina	Cane Toad	x	x	x					Exotic



Photo set 3: Feral Cat (left) and European Red Fox (right) detected within the referral area via motion sensor camera traps.

3.4. Technical detail on MNES present at, or in the vicinity to, the project site

Item 3.3 of the PD Request asks for, ***"For listed threatened species and ecological communities that have the potential, or are likely, to be present at and in the vicinity of the project site, including but not limited to those listed above, this section must provide the following:***

- ***a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.***
- ***b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.***
- ***c. Quality and importance of known or potential habitat for the species or communities.***
- ***d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.***
- ***e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.***

3.4.1 Koala (Phascolarctos cinereus)

- ***a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.***

Distribution

The Koala is found from north-east Queensland to the south-east corner of South Australia. Due to translocations, Koala are found outside their historic range, for example, Kangaroo Island. The distribution of Koala is influenced by altitude, temperature and leaf moisture, avoiding arid climates due to physiological stress. Thus, the density of the Koala population in coastal regions is generally greater than inland areas.

Habitat and Ecology

In South-east Queensland, a recent study completed by Rhodes *et al.* (2015) indicates that the average koala density across the region is estimated to be 0.04 koalas/ha. The majority of the region is predicted to have low population densities, suggesting that koalas in SEQ may be relatively widely distributed, but of low density in most areas (Cork & Sanson 1990). Rhodes *et al*. (2015) found a negative relationship between temperature and koala densities, which is associated with low koala densities in Ipswich and west Logan, where temperatures are relatively high. Data presented by Rhodes *et al*. (2015) indicates that the average koala density In Ipswich LGA from 1996 to 2015 is approximately 0.03 koalas/ha which is below the average koala density for SEQ.

Koala population estimates are carried out annually by the Commonwealth Scientific and Industrial Organisation (CSIRO) through the National Koala Monitoring Program (NKMP). As at March 2024:

- The latest data-driven estimate of population size for the EPBC Act listed koala population (combined populations of Queensland, New South Wales and the Australian Capital Territory) is between 95,000 and 238,000.
- This broadly aligns with the Threatened Species Scientific Committee (TSSC) estimate of 92,184 koalas in the combined Queensland, New South Wales and Australian Capital Territory population, based on best available information and expert elicitation in 2021.

- The latest population estimate for the koala populations not listed under the EPBC Act is between 129,000 and 286,000.

A recent study published by Law et. al. (2024) carried out over seven years also indicated a large population of koalas are present in NSW public forests. Occupancy levels have remained stable over a long period of time including during high-severity fires in 2019.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

The Koala has the potential to occur on site due to the presence of non-juvenile Koala habitat trees (NJKHTs). However, the likelihood of occurrence is significantly reduced by the context of the site surrounded on all sides by roads and urban developments.

Vegetation surveys conducted across the referral area determined the dominance of species broadly defined as Eucalypt woodland. Ecological surveys of the referral area recognised predominately *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark) with other species in lower densities. The referral area is considered a single assessment unit incorporating a small area in the south where regrowth and weeds dominate. For the purposes of this assessment, 7.38 ha is considered Koala habitat excluding the constructed dam.

The following vegetation communities have been delineated on-ground (refer **Plan A7**).

1. AU1 – Eucalypt woodland indicative of RE12.9-10.2 (7.38 ha)
2. Constructed dam

Further details regarding anticipated impacts on the Koala as a result of the proposed development are discussed in **Section 4**, avoidance, management and mitigation measures are discussed in **Section 5,** and proposed offsets are discussed in **Section 5.4**.

c. Quality and importance of known or potential habitat for the species or communities.

Under the *Queensland Vegetation Management Act 1999,* the referral area is mapped as containing predominantly Category B (remnant) vegetation, containing RE 12.9-10.2. This vegetation is recognised as providing suitable Koala Habitat.

NJKHTs are present across the referral area of primarily *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark). A review of ALA indicates that local Koala sightings have been recorded in locations surrounding the referral area, mostly to the north of the Cunningham Highway and west of the Centenary Highway. From these records it is noted that the nearest contemporary record to the referral area is from 2010, approximately 1 km north-east (refer **Plan A8**). Notably, this record was located within vegetation not connected. Field assessments within the referral area detected indirect evidence of Koala in the form of scats at one of the five SAT assessments completed, no direct observations were recorded.

Despite relatively intact vegetation within the referral area, this vegetation provides significantly limited connectivity potential given surrounding properties to the west, north and east are, or are expected to be, completely cleared. The site retains marginal connectivity potential to the south however Binnies Road has

been conditioned for upgrade under a sperate development approval. Only 2 trees of the 150 searched contained scats indicating 'low' usage with no direct sightings observed. Connectivity value of the vegetation within the site to other habitat patches has become is limited due to recent and ongoing development.

While Koala habitat is present within the referral area, the 7.52 ha area does not contribute significantly to critical habitat in the region particularly given the isolated nature of vegetation.

d. Information detailing known populations or recorded within at least five kilometres of the development footprint and (if known) the size of these populations.

A search of the Atlas of Living Australia returned 77 records for the species using a 5 km search radius from the site (refer **Plan A8**). Most of the sightings were recorded to the north of the Cunningham Highway and west of the Ipswich Boonah Road, particularly within and around RAAF Base Amberley. It is noted that the nearest contemporary record is from 2019, approximately 1.4 km north-east of the referral area.

Field assessments within the site detected indirect evidence of Koala in the form of scats at one of the five SAT locations, with no direct observations recorded. Koala scats were recorded at two trees at SAT 2, indicating a low level of Koala activity according to the East Coast Low threshold outlined in Phillips & Callaghan (2011).

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

Despite vegetation being present across the referral area, this vegetation provides significantly limited connectivity potential given surrounding properties to the west, north and east are, or are expected to be, completely cleared. The site retains marginal connectivity potential to the south however Binnies Road has been conditioned for upgrade where at present only a dirt access track remains.

Given only 2 of the 150 trees searched contained scats this indicates a 'low' likelihood of occurrence. Connectivity value of the vegetation within the site to other habitat patches is limited due to previous and ongoing development. The habitat within the referral area does contain suitable Koala habitat trees however it is considered unlikely that this vegetation is being used at present given the lack of evidence and lack of connectivity value.

3.4.2 Grey Headed Flying Fox (*Pteropus poliocephalus*)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

Distribution

The Grey-headed Flying-fox occurs between Rockhampton in Queensland to Melbourne in Victoria. The species will usually selectively forage where food is available and as such, its patterns of occurrence and relative abundance vary between seasons and years. There are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout its geographic range.

Habitat and Ecology

Grey-headed Flying Fox requires foraging resources and roosting sites to persist. The species is known to use a wide variety of habitats including subtropical and temperate rainforests, tall sclerophyll forest and woodlands, heaths, swamps and also urban and agricultural areas where food trees have been cultivated. The species is highly adaptive with its diverse native diet, which it can supplement with introduced species. It is known to forage within a variety of habitat areas as each resource does not produce food throughout the entire year.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

SEQ has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of eucalypt woodland. The site was confirmed to contain a number of eucalypt species from the *Eucalyptus*, *Corymbia*, *Lophostemon* and *Angophora* genera which provide year-round foraging resources. The species include *Angophora leiocarpa* (Smooth-barked Apple), *Corymbia citriodora* (Spotted Gum), *C. intermedia* (Pink Bloodwood), *C. tessellaris* (Moreton Bay Ash), *C. trachyphloia* (Brown Bloodwood), *Eucalyptus crebra* (Narrow-leaved Ironbark), *E. moluccana* (Gum-topped Box), *E. tereticornis* (Forest Red Gum), *E. seeana* (Narrow-leaved Red Gum), *E. siderophloia* (Grey Ironbark) and *Lophostemon suaveolens* (Swamp Box). Potential foraging habitat is limited to 7.38 ha of eucalypt vegetation, which is a fraction of the available habitat within the broader locality.

c. Quality and importance of known or potential habitat for the species or communities.

Surveys did not record GHFF foraging within or adjacent to the referral area nor as a fly-over species. Additionally, no roosts are present within or directly adjacent to the referral area. A review of the National Flying-fox monitoring viewer identified a GHFF roost approximately 2.5km north-east (Yamanto (479)). The nearest roost of national significance (Inala, Lilac Street (1219)) is located approximately 21.5 km north-east of the referral area (refer **Plan A9**).

Suitable foraging habitat is present in the form of Eucalypt and Corymbia dominated vegetation consisting of *Corymbia citriodora* (Spotted Gum), *Corymbia tessellaris* (Moreton Bay Ash), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus melanophloia* (Silver-leaved Ironbark) *and Eucalyptus tereticornis* (Forest Red Gum). However, given the availability of suitable foraging habitat within the broader area, including White Rock – Spring Mountain Conservation Estate and the Flinders-Goolman Conservation Estate, it is considered unlikely that the species would utilise the relatively small area of 7.38 ha associated with the site.

Despite potential foraging habitat occurring within the referral area, the area is not considered to provide critical habitat supporting an important population of the species due to the small size of the referral area, significant availability of habitat in the wider region and lack of local roosts.

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

SEQ has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of eucalypt woodland. Surveys did not record GHFF foraging within or adjacent to the site nor as a fly-over species. Additionally, no roosts are present within the referral area or directly adjacent. A review of the National Flying-fox monitoring viewer identified a GHFF roost approximately 2.5km north-east of the site (Yamanto (479)). The nearest roost of national significance (Inala, Lilac Street (1219)) is located approximately 21.5 km north-east (refer **Plan A9**).

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

Surveys conducted across the referral area to determine presence including general meander and spotlighting surveys during various site visits in February and August 2024 did not detect any GHFF individuals. While surveys did not identify any GHFF individuals, the potential for occurrence within the referral area cannot be excluded due to the presence of suitable foraging habitat. Given that field surveys failed to locate the species or any roosts, it is anticipated that if GHFF were to occur, they would only occur in a transitional foraging capacity. Due to the presence of favorable foraging resources and the known occurrence of the GHFF in the landscape, the species was assigned a 'moderate' likelihood of occurrence.

3.4.3 South-eastern Glossy Black-cockatoo (*Calyptorhynchus lathami lathami*)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

Distribution

South-eastern Glossy Black-cockatoos are known to occur from Mitchell, Queensland, through eastern New South Wales to East Gippsland, Victoria.

Ecology

South-eastern Glossy Black-cockatoos feed almost exclusively on she-oak seeds (*Allocasuarina* spp. and *Casuarina* spp.). They also show strong preference to individual feed trees and will not feed on many other proximate trees of the same tree species. Feeding reward is the main driver of this preference, with that being composed of the size of cones, the number and weight of seeds contained therein, and their nutritional content.

They are hollow nesters, utilising large hollows in living and dead eucalypt trees. The species usually occurs in pairs or in groups of three (made up of a breeding pair and their offspring), in woodlands. The movement patterns and ranging behaviour of the South-eastern Glossy Black-cockatoo are poorly understood. It has been suggested that they are seasonal migrants in south-east Queensland, likely as a response to changing of resource availability or breeding requirements, observed a correlation between group size and environmental conditions, such that larger foraging groups were observed when food resources were limited.

Habitat

South-eastern Glossy Black-cockatoos rely on nine species of sheoaks (*Allocasuarina* spp. and *Casuarina* spp.) for feeding (Chapman 2007), with species used varying depending on the region. Birds often only feed on one or two species in one region (Higgins 1999). In south-east Queensland and north-east New South Wales, they show preference for black sheoak (*A. littoralis*) and forest sheoak (*A. torulosa*), although there are also records of them feeding on stringybark sheoak (*A. inophloia*; G Castley, D Guthrie & Roselli unpublished data), coastal sheoak (*C. equisetifolia*), and to a lesser extent river sheoak (*C. cunninghamiana*) and swamp sheoak (*C. glauca*) during limited times of the year (Glossy Black Conservancy 2010).

In NSW the majority of the nesting hollows are in narrow-leaved ironbark (*Eucalyptus crebra*). Trees may be living or dead. As a guide, potential nest hollows for the subspecies have the following traits, >8 m above ground, located in branches >30 cm in diameter, Branch or stem no more than 45° from vertical; and Minimum entrance diameter of >15 cm. Further research is needed to expand our knowledge on the nesting habits and habitat of the subspecies (i.e., nest tree species used in other regions of the subspecies' range). Areas that are not currently occupied by the subspecies because they have been recently burnt but are capable of supporting cockatoo populations in the future, should also be considered as habitat critical for the survival of the south-eastern Glossy Black-cockatoo.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

The species requires two key habitat types, dense *Allocasuarina* species for foraging and large hollows for nesting. While the site does contain vegetation reflective of Eucalypt woodland, a dense stand of *Allocasurina* is not present. Only scattered individual *Allocasuarina luehmannii* (Bull Oak) were observed across the site resulting in extremely limited foraging resources. Furthermore, only 9 trees were recorded as containing potentially suitable hollows for the species (7 of which were dead/stag trees) which consequently provides limited roosting habitat.

There are no records of the species within 5 km of the referral area with the nearest records being approximately 9 km east. These records are both dated (1975) with the nearest contemporary records approximately 11.5 km east, associated with White Rock-Spring Mountain Conservation Estate where known suitable habitat exists (refer **Plan A10**).

c. Quality and importance of known or potential habitat for the species or communities.

The referral area offers limited foraging and roosting habitat for the species as a result of a lack of large hollows and lack of feed trees. Furthermore, the referral area is small (7.52ha) and located within a highly modified environment surrounded on all sides by roads and development. There are no records of the species within 5km of the referral area with all records associated with large area of intact vegetation that provides ample roosting and foraging habitat including White Rock Conservation Park (refer **Plan A10**).

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

Occurrence records of the South-eastern Glossy Black-cockatoo are scattered around the broader landscape with the closest contemporary records being approximately 11.5km south-east, associated with White Rock Conservation Park, White Rock-Spring Mountain Conservation Estate and Stewartdale Nature Refuge. Closer records exist around 9 km east and south-east of the site and associated with White Rock-Spring Mountain Conservation Estate and White Rock Conservation Park, however they are dated (1975) (refer **Plan A10**).

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

No evidence of the species occurring within the referral area were noted throughout the extensive field surveys suggesting the South-eastern Glossy-Black-cockatoo is not utilising the site for roosting or foraging. The ALA and WildNet search results show no records of this species within a 5 km radius of the referral area. The closest records are approximately 9 km east and are dated (1975) with the nearest contemporary records approximately 11.5km south-east, associated with White Rock Conservation Park, White Rock-Spring Mountain Conservation Estate and Stewartdale Nature Refuge.

The referral area does not provide suitable habitat for the species and is a small overall area, indicating it is highly unlikely for the species to occur.

3.4.4 Swift Parrot (Lathamus discolor)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

Distribution

The Swift Parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter. The broad distribution is approximately 1,250,000 km^2. They occupy habitats across all tenures, with the majority of habitats occurring outside formal conservation reserves. The breeding range of the swift parrot is largely restricted to the east and south-east coast of Tasmania and closely mirrors the distribution of blue gum (*Eucalyptus globulus*). The species breeds in the north-west of the state between Launceston and Smithton, however, the number of birds involved, and frequency of these breeding events is not well understood. Potential breeding habitat remaining in the northwest is scarce and highly fragmented. Whilst on the mainland the Swift Parrot disperses widely, foraging on flowers and lerps in *Eucalyptus spp.* mainly in Victoria and New South Wales. Only a small number of Swift Parrots are observed in Queensland on a regular basis. Within Queensland, the preferred foraging species include *Eucalyptus macrocarpa, Eucalyptus melliodora, Eucalyptus robusta, Eucalyptus tereticornis* and *Corymbia citriodora*. The species prefers large trees which flower consistently.

Habitat and Ecology

Swift Parrots are usually seen in small parties of up to 30 birds, or occasionally in flagger flocks (of several hundred birds) around sources of abundant food. Swift Parrots breed in Tasmania and then move to mainland Australia in Autumn for the non-breeding season.

They feed preferentially in the largest trees available. Their distribution fluctuates with food availability as they feed on psyllid lerps, seeds and fruit. Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, and coastal swamp mahogany (*Eucalyptus robusta*) and spotted gum (*Corymbia maculata*) woodland when in flower; otherwise often in coastal forests from eastern Victorian to the central coast of New South Wales. Within Queensland, the preferred foraging species include *Eucalyptus microcarpa, Eucalyptus melliodora, Eucalyptus robusta, Eucalyptus tereticornis* and *Corymbia citriodora*. The species prefers large trees which flower consistently.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

The species was not identified within the referral area nor as fly-over during field survey effort. Potential suitable habitat was broadly observed throughout the remnant vegetation including canopy species *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark). However, the species has a specific preference of large mature trees for feeding. As stated in the National Recovery Plan for the Swift Parrot (DCCEEW 2024), the larger the tree the more foraging value it has for Swift Parrots. Brereton et al. (2004) demonstrated a greater flowering frequency and intensity in larger Blue Gums and a preference by Swift Parrots to forage in these larger trees. Although the site contains predominantly remnant vegetation, a detailed review of individual trees found few large trees were present (74 trees ≥380 mm DBH, excluding dead/stag trees). Additionally, when comparing the large tree density within the referral area with the biocondition benchmark for RE12.9-10.2, the area only approximately a quarter of the benchmark value for

large trees measured at 380 mm DBH). The lack of large trees coupled with the small overall area (7.52ha) significantly limits availability of suitable habitat for the species.

Plan A11 demonstrates the potential habitat for Swift Parrot within the context of the impact site using preferred foraging species as detailed within the Swift Parrot Recovery Plan (Saunders and Tzaros, 2011)

c. Quality and importance of known or potential habitat for the species or communities.

The National Recovery Plan for the Swift Parrot identifies preferred foraging species on the mainland as Yellow Gum (*E. leucoxylon*); Red Ironbark (*E. tricarpa*); Mugga Ironbark (*E. sideroxylon*); Grey Box (*E. macrocarpa*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Forest Red Gum (*E. tereticornis*); Blackbutt (*E. pilularis*); and Spotted Gum (*Corymbia maculata*). Swift Parrots also preferentially forage in large, mature trees that provide more reliable foraging resources than younger trees.

Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38. In addition to the lack of mature trees, only 5 of the 74 large trees located on site were preferred foraging species for swift parrot, being *E. tereticornis*.

The referral area is not considered to provide known habitat and due to fragmentation from larger remnant areas (i.e., Flinders Karawatha Bioregional Corridor), the referral area is not considered to contain critical habitat for the species. Further, due to lack of records in the area and small overall size of the referral area, it is considered highly unlikely that this species will occur.

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

There are no known populations of the species within 5 km of the referral area. There are no records of the species within the locality with the closest record approximately 8 km west. Notably, given this species is Critically Endangered, the location of recorded sightings are generalised to 10 km (refer **Plan A11**).

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

The likelihood of occurrence for this species was based on several variables following detailed desktop and on-ground assessments. Firstly, the species has not been recorded within 5 km of the referral area with the majority of sightings approximately 14.5 km to the east. These records are adjacent to large area of intact vegetation that provides suitable habitat in the form of abundant mature vegetation. The referral area does not contain mature specimens of preferred foraging species for the swift parrot with only 5 mature *E. tereticornis* identified on site. Given all of these factors the likelihood that the species would utilise the referral area is very low.

3.4.5 Regent Honeyeater (*Anthochaera phrygia*)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

Distribution

The Regent Honeyeater is endemic to mainland south-eastern Australia. It has a patchy distribution which extends from south-east Queensland, through NSW and the ACT, to central Victoria. Records are widely distributed across its range, but it only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded. There are four known key breeding areas; three in NSW and one in Victoria (Garnett *et al.,* 2011; Higgens *et al.,* 2001; Webster and Menkhorst, 1992).

Habitat and Ecology

The species mostly inhabits slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation such as She-oak (*Casuarina spp.*) where it feeds on needle-leaved mistletoe and sometimes breeds (Webster and Menkhorst, 1992). It sometimes utilises lowland coastal forest which may act as refuge when its usual habitat is affected by drought. It also uses a range of other habitats including remnant patches in farmland and urban areas, roadside reserves and travelling stock routes (Higgens *et al.,* 2001).

The Regent Honeyeater's movement patterns are thought to be governed by flowering of select eucalypt species. The species is nomadic and partly migratory, with some predictable seasonal movements observed. The species is highly mobile and capable of travelling large distances; however, the regularity and extent of long-distance movements are unknown. It obtains nectar mainly from eucalypts and mistletoe and is reliant on species with reliable nectar flows. The species prefers mature trees that are taller and larger in diameter. As per the recovery plan, key eucalypt and mistletoe species include Mugga (or Red) Ironbark (*Eucalyptus sideroxylon*), Yellow Box (*E. melliodora*), White Box (*E. albens*), Yellow Gum (*E. leucoxylon*), Spotted Gum (*Corymbia maculata*), Swamp Mahogany (*E. robusta*), Needle-leaf Mistletoe (*Amyema cambagei* on River Sheoak, *Casuarina cunninghamiana*), Box Mistletoe (*A. miquelii*) and Long-flower Mistletoe (*Dendropthoe vitellina*). Other tree species may be regionally important. For example, the Lower Hunter Spotted Gum forests have recently been demonstrated to support regular breeding events of Regent Honeyeaters. Flowering of associated species such as thin-leaved stringybark (*E. eugenioides*) and other stringybark species, and broad-leaved ironbark (*E. fibrosa*) can also contribute important nectar flows at times.

Aggregations historically occurred at nectar sources, mostly during autumn and winter, but these events are now rare. When nectar is scarce, lerp and honeydew can comprise a large proportion of the diet. Insects make up about 15% of the total diet and are important components of the diet of nestlings.

The species roosts communally in small groups or large flocks, in trees with dense foliage. Foraging trees are rarely used as roosting sites.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

Due to the sensitivity of this species, the Queensland Department of Environment, Tourism, Science and innovation (DETSI) do not release official record details of this species, as such, a public database platform had to be utilised to analysis historical records of the species within a 5 km radius of the site.

A review of the Atlas of Living Australia (ALA) database identified 1 (one) record of the species within 5 km of the referral area (approx. 4.5km south-east) (refer Plan **A11**). Notably, this record has been generalised to 2 km by DETSI. Records are generally present further west where White Rock Conservation Park is present.

c. Quality and importance of known or potential habitat for the species or communities.

Most records of regent honeyeaters come from box-ironbark eucalypt associations, where the species seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. Other forest types regularly utilised by regent honeyeaters include wet lowland coastal forest and riverine woodlands. The referral area does not contain any waterways or wet lowland forest that would provide critical habitat for the species.

The recovery plan lists key tree and mistletoe species for the regent honeyeater. None of these species were identified in the referral area. In addition to preferred foraging species, the recovery plan also identifies key areas regularly used by regent honeyeaters as habitat critical to the species survival. Regularly used areas include Bundarra-Barraba, Hunter Valley, Capertee Valley and Chiltern. All of these areas are located several hundred kilometres from the referral area.

The recovery plan states that mature, large individual trees tend to be more important as they are more productive, particularly on highly fertile sites and in riparian areas. As previously noted, the referral area does not contain any waterways or riparian areas. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38, therefore would not be considered high value habitat for regent honeyeater. No mistletoe was observed on site.

The extent of potential and known foraging habitat for the Regent Honeyeater based on a desktop analysis of remnant vegetation mapping is shown in **Plan A11**.

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

Due to the sensitivity of this species, the Queensland Department of Environment and Science do not release official record details of this species, as such, a public database platform had to be utilised to analyse historical records of the species within a 5 km radius of the referral area. Ther is a single record of the species approximately 4.5 km south-east of the site which has a 2km uncertainty buffer (refer **Plan A11**). No populations are known to occur within 5 km of the development footprint.



e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

The referral area is located within a highly modified landscape transitioning to urban development. The referral are does not contain preferred foraging species, however evidence of historical logging was observed resulting in few large mature trees. Furthermore, the small 7.52 ha referral area is highly unlikely to be utilised by the species particularly given the availability of intact remnant vegetation in the broader landscape.

3.4.6 Greater Glider (Petauroides volans)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

Distribution

The Greater Glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 1200 m above sea level.

Habitat and Ecology

The Greater Glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forest and woodlands. It is primarily folivorous with a diet mostly comprising of eucalypt leaves and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The species favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.

During the day it shelters in tree hollows, with a particular preference for large hollows in large, old growth trees (Smith *et al.,* 2007). The species is considered to be particularly sensitive to forest clearance and intensive logging practices due to requirement for old growth forests and contiguous bushland (Kavanagh and Wheeler, 2004). Greater Gliders have relatively low persistence in small forest fragments and disperse poorly across vegetation that is not native forest. Modelling suggest that they require native forest patches of at least 160 km^2 to maintain viable populations (Eyre 2002).

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

The referral area does contain vegetation mapped as remnant of a community broadly considered habitat for the Greater Glider. Habitat for Greater Glider is directly correlated to the abundance of hollows, in Queensland that is recognised as 2-4 hollows per 2 ha as per the Conservation Advice. Targeted searches of all large trees (DBH ≥380mm) identified a lack of large mature specimens and hollow bearing trees which are a key habitat requirement for the species.

Hollow bearing trees are present at a density of 1.19 hollows per ha however only 0.26 living hollows per ha, which is below what is considered necessary for the species. It is acknowledged that ground-based surveys have the potential to underestimate hollow numbers with a study by Rochelmeyer et al (2025) finding that drone-based surveys improve hollow detection by at least 15% in comparison to ground-based surveys. Even if hollows were underestimated by twice that number (i.e. 30%) hollows would still be less than 2 per ha.

It is also of note that, while Rochelmeyer et al (2025) found that drone-based surveys were better at identifying hollows, they also found 38% of hollows were blocked and inaccessible to fauna. This level of detail cannot be acquired by ground-based surveys and suggests useable hollows are likely lower than the number observed.

Furthermore, the referral area is located in a highly urbanised area fragmented by existing and ongoing residential development. The species is particularly sensitive to areas of disturbance and exhibit avoidance behaviours from the edge of bushland which, given the large edge to area ratio of the referral area, reduces the value of the habitat present on site. Coupled with the low density of hollow bearing trees this indicates that the entire referral area is unsuitable habitat for the species (refer **Section 4.6** for further justification)

c. Quality and importance of known potential habitat for the species or communities.

The referral area does not contain suitable habitat for the species because of a lack of specific habitat requirements. Furthermore, the referral area is centrally located within RVPDA and zoned wholly as 'urban living.' The planning intent of the site and surrounds is reflected in existing development approvals of the area. The site is not within a functional ecological corridor at present given the existing developments and will not form part of any future corridor due to the planning intent of the region. Important habitat for the species is associated with large contiguous areas of mature vegetation communities that provide ample hollows and protection and buffers from future developments. These areas align with the 'environmental protection' zoning of RVPDA which are strategically positioned to maximise broadscale connectivity by linking with existing regional corridors such as White Rock Conservation park and Flinders Karawatha corridor.

A detailed analysis of existing and future fragmentation of properties immediately surrounding the referral area is included in **Section 3.1**. In summary:

- Properties adjoining the eastern and northern boundaries of the referral area have been cleared and are currently being developed with low density housing.
- The property adjoining the western boundary has all the required approvals (including an NCA decision under the EPBC Act) and is in the process of staged development which will remove all vegetation along the boundary with the referral area.
- Daleys Road is situated between the referral area and the western property including a two-way road and large pedestrian track creating a 30m cleared corridor. The Binnies Road reserve is located adjacent to the southern boundary with areas to the east and west already constructed.
- The property immediately south of Binnies Road has lodged an application for residential development and is currently working through that process. Vegetation on this property has been mapped as 'young to intermediate' by Griffith University therefore is unlikely to provide habitat for Greater Glider.

The referral area does not provide high quality or important habitat for the species as a result of historical logging and surrounding fragmentation.

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

No populations are known to occur within 5 km of the site (refer **Plan A12**). Records occur when the search radius is extended to 20 km with the records predominately occurring within contiguous vegetation areas in White Rock Conservation area to the south-east and Flinders Karrawatha corridor. No evidence of Greater Glider was noted throughout extensive field survey effort and targeted spotlighting surveys.

A search of the ALA using a 10 km search radius from the site returned no records for the species. The nearest record for the species was identified in 2023 in White Rock-Spring Mountain Conservation Estate, approximately 14 km south-east.

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impact outside the project site.

The vegetation within the referral area does not provide suitable habitat for the species and is highly isolated given surrounding properties to the west, north and east are, or are expected to be, completely cleared. The referral area retains marginal connectivity potential to the south, however Binnies Road is conditioned to be upgraded following the delivery of the approved neighbouring development. A combination of these factors indicates it is highly unlikely that the species will utilise the site at present or in the future. The referral area is significantly isolated from existing records and suitable vegetation furth south-east.

3.4.7 South-eastern Yellow-bellied Glider (*Petaurus australis australis*)

a. Information on the abundance, distribution, ecology and habitat preference of the species or communities.

<u>Distribution</u>

The South-eastern Yellow-bellied Glider (south-eastern) is found at altitudes ranging from sea level to 1400 m above sea level and has a widespread but patchy distribution from south-eastern Queensland (Qld) to far south-eastern South Australia. In Queensland the distribution also extends inland to the western slopes of the Great Dividing Range. Most of the Qld distribution is coastal, extending southward along the eastern seaboard from north of Mackay and continuing through the NSW-Qld border. The specific habitat requirements of the subspecies also lead to disjunct distributions, even in continuous sections of forest. Small social groups occupy large and exclusive home ranges and occur at low densities.

<u>Habitat and Ecology</u>

The South-eastern Yellow-bellied Glider (south-eastern) occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests. Abundance is highly dependent on habitat suitability, which is in turn determined by forest age and floristics. The subspecies shows a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter. There is also a clear preference for forests with a high proportion of winter-flowering and smooth-barked eucalypts. They require some level of floristic diversity to provide a year-round food supply, and they are unlikely to persist in forests dominated by only one or two tree species. Many tree species are found in the subspecies' habitat, with some used for sap feeding.

The South-eastern Yellow-bellied Glider is nocturnal, is active most of the night and devotes 90 percent of the time spent outside the den to foraging-related activities. The subspecies is social and lives in family groups of two to six individuals (though usually three to four) of varying age and sex composition, throughout an exclusive home range of approximately 50–65 ha (plausible range 25–85 ha). Home ranges are necessarily large, because the trees used as foraging substrates are dispersed and use of trees can vary through time and space.

The subspecies has very low dispersal capabilities over spaces larger than its gliding distance. The maximum gliding distance may be up to 120 m–140 m though management should be informed by average gliding performance. Average performance in low-canopy forest has been documented at 25.2 m, and it is suggested a glide ratio (horizontal distance/height dropped) of 2.0 should be used to estimate gliding distance for management decisions.

During the day, the South-eastern Yellow-bellied Glider (south-eastern) shelters in hollows found in large, old trees, usually more than one metre in diameter.

b. Quantification of the extent of habitat (including maps identifying known or unknown potential habitat) on site and, where feasible, in the broader landscape.

The referral area contains potential South-eastern Yellow-bellied Glider habitat, in the form of eucalypt woodland. Field surveys found that key habitat features for this species are not present in the referral area including:

- No trees with a DBH greater than 1 m are present with the largest tree 15 cm too small. The number of mature trees and hollows in the referral area are generally low with approximately 10 large trees per ha and less than two hollows per hectare.
- Vegetation on site has been classified as young to intermediate maturity by Griffith University (refer to **Plan A22**) and not the mature old growth forest preferred by the species.
- The referral area is approximately 7.5 ha and exists within a highly fragmented landscape including existing and ongoing residential development and infrastructure upgrades including roads (refer to **Section 3.1** and **Plan A03**) resulting in canopy gaps larger than 25 m to the north east and west.
- Some connectivity currently exists to the south however this area is currently under application for future residential development. Vegetation currently present in this area is mapped as young and young to intermediate by Griffith University therefore is unlikely to contain habitat for the yellow-bellied glider.

The vegetation within the referral area is therefore considered to have low habitat values for this species and is adjacent to high levels of disturbance as roads and urban developments. In addition, the small referral area results in a high edge to area ratio limiting the availability of habitat that is not in close proximity to highly modified areas.

c. Quality and importance of known or potential habitat for the species or communities.

Field surveys confirmed that potentially suitable eucalypt forest habitat occurs on-site. However, large hollow bearing trees were limited by historical clearing. Only 9 hollow-bearing trees were recorded over the entire



referral area, 7 of which are dead/stag trees which are not preferred by the species. Additionally, targeted spotlighting surveys failed to locate the species within the referral area and no identifying sap feeding notches were observed.

A review of the ALA and WildNet databases confirm that there are no records of the species within 5km of the site, with the closest record being located approximately 6 km to the east in a patch of remnant vegetation. The vegetation on-site is not well connected to this area as roads and major urban development are present (refer **Plan A13**). Vegetation in this area contains patches of 'intermediate' and 'intermediate to mature' aged vegetation as mapped by Griffith University (refer to **Plan A22**) therefore likely contains larger mature trees and hollows preferred by this species.

Within the broader landscape more contiguous preferrable habitat occurs to the south-east of site in association with existing conservation areas White Rock-Spring Mountain Conservation Estate, Spring Mountain Forest Park and remnant vegetation within Greenbank Military Training Area (refer **Plan A13**).

Given the high levels of disturbance, existing modification and cleared areas across the locality, and the abundance of more preferential habitat, the value of on-site habitat for South-eastern Yellow-bellied Glider is limited.

d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

A review of the ALA and WildNet databases confirm that there are no records of the species within 5km of the site, with the closest record being located approximately 6 km to the east in Spring Mountain Forest Park (dated 2020).

The occurrence record of South-eastern Yellow-bellied Glider within the last 20 years has a concentration to the south-east of the proposed impact site (refer **Plan A13**). These records currently exist beyond existing residential development reducing the potential connectivity to the site. Some records were noted within existing large vegetation patches to the south-east in White Rock-Spring Mountain Conservation Estate, Spring Mountain Forest Area and Greenbank Military Training area, which contain a higher proportion of mature remnant eucalypts.

Field surveys confirmed only 9 hollow-bearing trees within the referral area, 7 of which are dead/stag trees which are not preferred by the species. Additionally, targeted spotlighting surveys failed to locate the species on-site. Field surveys also confirmed that the site is surrounded by high levels of disturbance, including roads and residential development. Given the species is highly susceptible to disturbances and is unlikely to utilise an area in proximity to disturbance, it would be highly unlikely the species would utilise vegetation on-site.

e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.

Considering the lack of suitable habitat available within the referral area, which is adjacent to roads and urban areas, it is considered unlikely that the South-eastern Yellow-bellied Glider will occur on the site. Therefore, the species has been assessed as being unlikely to occur.

4. Assessment of Impacts

This section responds to Item 4 of the PD request which requires the proponent to provide an assessment of potential impacts on the listed threatened species and ecological communities that are likely to be present at, and in the vicinity of, the project site, including those listed on page 6-8 of the PD request including:

- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT, listed as endangered; and
- Grey-headed Flying-fox (*Pteropus poliocephalus*), listed as vulnerable.

It is noted that the DCCEEW also considers there is evidence that the following species listed under the EPBC Act may also be present, or have habitat present, on or within the vicinity of the impact site, and may also be impacted by the proposed action:

- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*), listed as vulnerable,
- Swift Parrot (*Lathamus discolor*), listed as critically endangered,
- Regent Honeyeater (*Anthochaera phrygia*), listed as critically endangered,
- Greater Glider (*Petauroides volans*), listed as endangered, and
- South-eastern Yellow-bellied Glider (*Petaurus australis australis*), vulnerable.

The action should be considered at its broadest scope. All components of the action should be considered, including any associated infrastructure.

The PD Request states, ***this assessment should include a clear description of the total extent and quality of habitat impacted and should include consideration of:***

- ***The nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely or be unknown or irreversible***
- ***Timing and whether the impact is temporary or permanent***
- ***species specific habitat requirements such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable)***
- ***whether connectivity and movement opportunities in the surrounding area may be retained, removed or functionally lost or compromised***
- ***adjacent areas of habitat that may or will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence)***
- ***indirect or facilitated impacts that may result from the proposed action,***

- ***cumulative impacts, where potential project impacts on MNES are in addition to existing impacts of other activities (including current or future developments by the proponent and other proponents in the region and vicinity)***

Item 4 of the PD Request states, ***based on the information available, the Department considers the proposed action will result in the loss of:***

- ***7.38 ha of habitat critical to the survival of the Koala,***
- ***7.38 ha of foraging habitat for the Grey-headed Flying-fox***

4.1. Koala

4.1.1 Modified Habitat Quality Assessment Method

The proposal results in the clearing and functional loss of 7.38 ha of vegetation that is identified as providing critical habitat for the Koala. The site is considered to be reflective a single assessment unit owing to a consistent vegetation across the site (refer **Plan A18**).

In order to determine the quantum and quality of the habitat suitable for Koala on-site, the vegetation has been assessed using a modified version of the Queensland State Governments *'Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy'* Version 1.2 April 2017. This assessment approach utilises the *Queensland BioCondition Assessment* method combined with site context and species stocking rate assessments to determine the habitat quality of the impact area.

The purpose of this guideline is to provide a methodology for proponents to determine the habitat quality of a site under the Queensland Environmental Offsets framework. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES). BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland V2.2 February 2015 provides the base methodology for the Guide to determining terrestrial habitat quality and in some cases the scoring and methods from BioCondition have been used within our Modified Habitat Quality Assessment Tool. These instances are identified within the methodology.

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

Site Condition (30%)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset site 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 expected range for a relatively undisturbed community.

The site condition assessment under the MHQA is assessed using 15 condition characteristics. Each condition characteristic and the relevant scoring and benchmark percentage is provided in **Table A13**. It should be noted that the attributes for the quality and availability of foraging and shelter habitat are scored differently to the biocondition manual in the MHQA therefore benchmarks are not provided in Table A13. Methods for calculating these attributes are detailed in the following section.

Table A13: Koala site condition scoring attributes (BioCondition Manual)

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

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).

To reflect the importance of food trees to koala habitat, the quality and availability of foraging habitat has been assessed using two parameters:

- Abundance of koala food trees
- 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.

All koala food trees (eucalypt, corymbia and angophora species) with a DBH >100mm were counted within a 100m x 20m plot at each habitat transect to estimate abundance. 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). Only the T1 stratum has been utilised. 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 site condition assessment provides an accurate estimate of food source availability, and if anything would overestimate food availability giving a conservative baseline score. Canopy cover has been averaged and compared to the benchmark for the regional ecosystem. A score out of 2 has been calculated 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 10 for quality and availability of food sources. For the purposes of the MHQA condition assessment, scores will be categorised as follows:

- 0-2.99/10 will be given a 1 in the MHQA
- 3-6.99/10 will be given a 5 in the MHQA
- 7-10/10 will be given a 10 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 with a range of ancillary species used as long as they are near a food source. Trees selected are often larger with a DBH 0f 30cm – 60cm.
Two parameters have been used to assess shelter habitat values at the impact and offset sites:

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

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 in the assessment is 60% for shelter tree abundance and 40% for large trees.

All shelter trees with a DBH >100mm were counted within a 100m x 20m plot at each MHQA transect completed at the impact and offset sites to estimate abundance. 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 stratums, only the T1 and T2 stratums have been utilised as the T3 stratum is likely to be considered part of the understorey. A score out of 6 calculated as follows:

- <1% – 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 shelter trees are counted over a 100m x 50m plot at each MHQA transect completed at the impact and offset sites to estimate abundance of large trees. The count is multiplied by 2 to produce a density per hectare which is averaged across the assessment unit and compared to the benchmark for the regional ecosystem. A score out of 4 is calculated as follows:

- <1% – 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 will be categorised as follows:

- 0-2.99/10 will be given a 1 in the MHQA
- 3-6.99/10 will be given a 5 in the MHQA
- 7-10/10 will be given a 10 in the MHQA

Site Context (30%)

The site context assessment considers the landscape characteristics adjoining the site. 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 MHQA, site context is measured using seven characteristics. In developing the MHQA, three species habitat index characteristics were nominated to form part of the site context characteristics: role of site location to overall species population in the state and, threats to the species, and species mobility capacity. The seven characteristics are listed below with details of how each are measured in accordance with the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (version 1.2).

Size of patch

Measured as the area of vegetation in which the assessment unit(s) is contained, and add on all other directly connecting areas of 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. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors).

Connectedness and Context

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

The context score is calculated by 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.

Unlike the traditional habitat quality assessment methodology where site connectedness and context are assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Koala habitat. While remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas 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 was determined 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 EPBC 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 assessment scale for EPBC referrals.

Ecological corridors

This attribute is as per the methods of the Guide to determining terrestrial habitat quality V1.2 and 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 remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, for example, Koala, this is not their primary function when assessing the attribute. An 'ecological corridor' is represented as any 'Riparian' or 'Terrestrial' feature within the 'CORR_TYPE' attribute table of the 'Queensland biodiversity and vegetation offsets special features' map. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.

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.

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 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 was applied to determine threats to species:

- 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).

Species mobility capacity

Species mobility is scored based on the presence and severity of factors that would contribute to a reduction in the mobility of the species. This can include 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 below:

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 Guideline 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 40m 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 below.

Potential severity assumes a 'worst case' scenario and site-specific conditions need to be considered for the assessment. For example, a rural property surrounded by barbed wire fencing with small infrastructure littered throughout the property may only provide a moderate impediment to koala movement whereas residential areas with a mosaic of timber and colour bond fencing site would be considered a high or severe impediment.

Potential Severity	Impediment	Primary Effect on Mobility	References
Severe	**Habitat Loss & Fragmentation**	Isolates habitat patches; reduces canopy connectivity; forces ground travel. The site must be isolated from any other vegetation cleared land with uses incompatible to koala movement.	Rhodes et al. 2006 McAlpine et al. 2006 Youngentob 2021
Severe	**Roads & Vehicle Traffic**	Roads act as hard physical barriers; vehicle strikes kill dispersing koalas. Dual lane or high trafficked roads with no or limited koala movement features such as underpasses are considered a high barrier to dispersal.	Rhodes et al. 2006 Lunney et al. 2002
Highly	**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
Highly	**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
Moderate	**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)
Moderate	**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:

- 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.
- Restriction in each quadrant will be allotted a percentage score based on severity as follows:
    - No or any minor restriction not listed in Table 2 – 0%
    - Any moderate restriction as listed in Table 2 – 40%
    - Any high restriction as listed in Table 2 – 65%
    - Any severe restriction as listed in Table 2 – 90%

The restriction percentages for each quadrant are added together and divided by 4 to obtain an overall reduction in mobility for the site. A score is then allotted according to the mobility restriction severity scoring from the Guide to Determining Terrestrial Habitat Quality version 1.2.

Scoring attributes extracted from the Habitat Quality Guideline are provided in **Table A14**.

Table A14: Koala site context scoring attributes

Site context attribute	*Scoring and benchmark percentage*				
Size of patch	0	2	5	7	10
	<5 ha	5-25 ha	26-100 ha	101-200 ha	>200 ha
Connectedness	0	2	4		5
	0-10%	>10-<50%	50-75%		>75% or >500 ha
Context	0	2	4		5
	<10% habitat	>10-30% habitat	>30-75% habitat		>75% habitat
Ecological corridors	0	4	6		
	Not within	Sharing a common boundary	Within (whole or part)		
Role of the site location to species overall population in the state	1	4	5		
	Not or unlikely to be critical to survival of the koala	Likely to be critical to survival of the koala	Critical to the survival of the koala		
Threats to the species	1	7	15		
	High threat level	Moderate threat level	Low threat level		
Species mobility capacity	1	4	7	10	
	Severely restricted (76-100% reduction)	High restricted (51-75% reduction)	Moderately restricted (26-50% reduction)	Minor restriction (0-25% reduction)	

Species Stocking Rate (40%)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the koala carrying capacity of the site at the time of undertaking the survey. 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 – whether or not evidence of Koala has been recorded within or adjoining the site. Evidence may be direct in the form of observation of Koalas, or indirect via the presence of scats.
- Species usage of the site (habitat type and evidenced usage) – the type of habitat includes vegetation structure such as whether it contains remnant, regrowth or non-remnant vegetation values, and evidenced usage is the confirmed presence or use of the species within the habitat. While habitat type for the Koala does not differ between foraging and breeding, both factors (habitat type and evidence of usage) are used to inform the species usage of the site. Depending on the level of variability in vegetation and usage patterns across the site, this characteristic may be scored differently for assessment units.
- Approximate density of the species on the site – measured through the use of Spot Assessment Technique (SAT) (Phillips *et al.* 2011) and targeted searches with a high probability of detection, including UAV drone surveys. The combination of methods produces a higher reliability of data when extrapolating koala density. The SAT method 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 **Table A9**. 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 A15** outlines the attributes utilised to assess species stocking rate.

Table A15: Koala Species Stocking Rate Scoring

Attribute	*Scoring and criteria*			
Presence detected on or adjacent to site (neighbouring property	Score (/10)	0	5	10
		No	Yes – adjacent to site	Yes – on-site



Attribute	*Scoring and criteria*				
with connecting habitat)					
Species usage of the site (habitat type and evidenced usage)	Score (/15)	0	5	10	15
		Not habitat	Dispersal habitat	Foraging habitat	Breeding habitat
Approximate density (per ha)	Score (/30)	0	10	20	30
		0%	Low	Medium	High
*Role/importance of species population on site**	Score (/15)	0	5	10	15
		0	5-15	20-35	40-45
Total SSR	/70				
SSR Score	/4				

**Species Stocking Rate supplementary table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15*			
Key source population for breeding	Score (/10)	0	10
		No	Yes/Possibly
Key source population for dispersal	Score (/5)	0	5
		No	Yes/Possibly
Necessary for maintaining genetic diversity	Score (/15)	0	15
		No	Yes/Possibly
Near the limit of the species range	Score (/15)	0	15
		No	Yes

Scoring Weight Justification

For this project, site condition was given a weighted score out of 3, site context was given a weighted score out of 3, while species stocking rate was given a weighted score out of 4. The species stocking rate is an important component when assessing the overall habitat quality of a site as it indicates species usage and the capacity of a given area to support the koala therefore was weighted more heavily.

Site condition was weighted with a score out of 3. The koala is known to occupy a variety of habitats, ranging from non-remnant regrowth eucalypt forest / woodland through to old growth remnant forest / woodland. However, the site condition of the habitat is considered to directly influence the long-term koala carrying capacity.

Site context was weighted with a score out of 3. Site context is considered an important component when assessing the koala as it directly relates to the long-term survival rate of the species. The proximity of the site to other areas of suitable habitat, the movement pattern through the landscape of the koala (and / or barriers inhibiting movement), and threats to the species are important attributes to assess when considering the overall functionality of the site.

It is considered that the provision of this weighted scoring most accurately quantifies the ecological requirements of the koala, which will then assist in determining whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset.

4.1.2 Discussion

The habitat quality scores for referral area, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A14** and **Table A15.** A single assessment unit has been used for the 7.38 ha of Koala critical habitat (refer **Plan A18**).

Site Condition

A single assessment unit (AU) was defined on-site which scored 2.10 out of 3 for site condition. AU1 scored 10 for quality and availability of food and foraging as well as quality and availability of shelter. Scoring for these parameters is provided below.

Koala Food Tree Abundance

Assessment Unit	RE	Benchmark (trees/ha)	Site Count (trees/ha)	Benchmark Percentile	Score
Impact AU1	12.9-10.2	110	210	88%	8/8

Canopy Cover

Assessment Unit	RE	Benchmark (% cover)	Site (% cover)	Benchmark Percentile	Score
Impact AU1	12.9-10.2	64	64.2	100%	2/2

Total Score Impact AU1 - 10/10
MHQA Score – 10/10

Shelter Tree Abundance

Assessment Unit	RE	Benchmark (trees/ha)	Site Count (trees/ha)	Benchmark Percentile	Score
Impact AU1	12.9-10.2	110	253	100%	6/6

Large Trees

Assessment Unit	RE	Benchmark (trees/ha)	Site (trees/ha)	Benchmark Percentile	Score
Impact AU1	12.9-10.2	38	11	29%	2/4

Total Score Impact AU1 - 8/10
MHQA Score – 10/10

Site Context

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 is scored such that is reflects the fact 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 achieved a score of **10 out of 10** as the critical koala habitat patch on-site is connected to a vegetated corridor of greater than 5000 ha (as per the Guideline to determining terrestrial habitat quality methodology (refer **Plan A16**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the site is connected with adjacent Koala habitat. 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 which was calculated at 0%, and consequently this attribute scored a **0 out of 5** as per the Guide to determining terrestrial habitat quality methodology (refer **Plan A16**).

Context

The context attribute refers to the amount of critical Koala habitat that is retained within a 1 km buffer of the site being assessed and is calculated using GIS. Retained critical koala habitat within a 1 km buffer of the site was calculated at 49.8 %, and therefore the context attribute achieved a score of **4 out of 5** as per the Queensland BioCondition Assessment methodology (refer **Plan A16**).

State Mapped Ecological Corridors

GIS was utilised to identify the sites' role in any ecological corridors on or adjacent to the site. The site is mapped within an ecological corridor (refer **Plan A17**). A score of **6 out of 6** was given to the State Mapped Ecological Corridors component of Site Context.

Role of site location to species overall population in the State

This attribute aims to quantify the geographical importance of the site for koala populations across the broader state. The referral area contains Koala habitat and evidence of the species was recorded, therefore a score of **5 out of 5** was considered appropriate.

Threats to the species

The 'threats to the species' attribute aims to quantify potential risks to the survival of Koala existing within and adjacent to the referral area. Key known threats to the survival of the Koala include proximity to main roads increasing the risk of motor vehicle strike, as well as predation by wild or domestic dogs as reference in the conservation advice for the species.

Table A16 provides a risk matrix relative to the conservation advice for the Koala to determine threats to species. Essentially, each of the threats identified within the conservation advice is weighted relative to the identified level of risk, with the weighted scores summed to provide the threat score, noting the MHQA allows for only scores of 1 (high), 7 (moderate) or 15 (low) for threats.

An analysis of the scoring attributes for the site is provided the following outcomes:

- Clearing and degradation of habitat – the referral area is zone as 'urban living' within the Ripley Valley Priority Development Area. The zoning intent of 'urban living' is to focus development within strategic areas of high disturbance and modification with high value vegetation retained as large contiguous corridors. This site is highly likely to be developed as part of this zoning with development/roads present on all sides. A high-level review of surrounding land indicates at least 75% degraded land within 5 km primarily a result of development and major roads to the north and existing cleared rural land to the west and east (**Insert A2**). Intact vegetation is primarily present to the south. Degraded land includes vegetation that has been cleared or modified for rural or urban uses. Therefore, a weighted score of **0.4** or 'high risk' is appropriate.
- Inappropriate fire regimes – The RVPDA development scheme identifies the referral area as 'transitional bushfire risk area.' This mapping recognises an existing threat from bushfire which may reduce following the expected completion of surrounding development. A non-Koala specific Bushfire Management Plan is not in place for the referral area which Is considered to have moderate-high fuel loads. Therefore, a weighted score of **2.8** or 'moderate risk' is appropriate.
- Vehicle strike – The site is less than 1km south of the Cunningham Highway with no fauna fencing or underpasses present on the stretch of highway near the site. Existing residential developments are also present immediately north and east with sealed roads present on-all sides of the referral area including Tempo Drive, Daleys Road and Binnies Road (**Insert A3**). No Koala mitigation measures are in place such as Koala exclusion fencing indicting the threat of vehicle strike is high. The threat is further increased by the large edge to area ratio of the site meaning that any Koala that utilises the vegetation within the referral area is likely to cross roads in order to move through the landscape. Therefore, a weighted score of **0.7** or 'moderate risk' is appropriate.
- Dog attack – While the threat of dogs is known to be present with Wild Dogs and domestic dogs having been recorded across the broader locality, no dogs were recorded within the site during site surveys. Therefore, a weighted score of **1.5** or 'low risk' is considered appropriate.

The site achieved a score of 5.4 out of 15 which results in a threats a score of **7 out of 15 or 'moderate risk'** as appropriate for the site.

Table A16: Koala Threat Scoring Matrix (green shading indicates applicable scores for the site)

Metric	Low	Moderate	High
Threat Thresholds			
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 ≤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 ≥ 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) to protect the Koala is in effect.	Non-Koala specific BMP in effect. OR Low fuel load and low fire risk.	Site has a high fuel load and/or high fire risk.
Score Weighting	**6**	**2.8**	**0.4**
Vehicle Strike Moderate Risk	Located more than 1km from a major road AND Minor roads servicing residential or industrial areas located within 500m contain some safe design features	Located <500m from a major road with fauna safe design features) OR Located <1km from a major road accessible for koalas (minimal fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m	Located <500m from a major road with minimal 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 site.	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	>5 and ≤10	≤5



Insert A2: high level analysis of degraded land within 5 km of the referral area (>75%)



Insert A3: Roads (red) adjacent to the referral area providing high risk of vehicle strike

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. Assessment has been carried out in accordance with method outlined in Section 4.1.1 with outcomes provided below. The site is considered highly restricted giving it a score of 4/10.

Direction	Description of restriction	Restriction score
North	Land immediately north of the referral area has been cleared and developed as low to medium density residential	Severe – 90%
East	Land immediately north of the referral area has been cleared and developed as low to medium density residential. A collector road is also constructed adjacent the boundary	Severe – 90%
South	Areas south of the referral area is likely to be developed in the future however currently contains remnant and regrowth vegetation.	No restriction
West	A dual lane road is present immediately adjacent to the western boundary of the referral area including a bike path. The cleared area exceeds 30m.	Highly – 65%

Total restriction score
270 / 4 = 61.25% (highly restricted)

Species Stocking Rate

The final component of the MHQA technique is species stocking rate. The species stocking rate provides an estimation of the landscape's capacity to support Koala and their range of life cycle requirements including dispersal, foraging and breeding as well as population-level dynamics. A species stocking rate score of **40 out of 70** was attributed to the referral area reflecting foraging and breeding activities and **30** Refer to **Table A17 and Table A15** for results.

- Further details on the justification for the scoring of each attribute is provided below:
- Presence – No direct sighting of Koala was recorded within the referral area despite several days of surveys. Indirect evidence (scats) was recorded at one of the five (5) SAT locations. Therefore, 'presence detected on site' was assigned a score of **10 out of 10**
- Species usage of the site (habitat type and evidenced usage) – This attribute was scored a **15 out of 15** for the referral area indicating foraging/breeding habitat due to the presence of Koala evidence and Koala habitat trees.
- Approximate density – This attribute was scored as **10 out of 30** for the referral area indicating low usage within the site as supported by on-site data from SAT surveys

- Role/importance of species population on site – Using the precautionary principle, the site 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** for the site.

To summarise, the proposed action will impact on degraded vegetation values that are considered to provide habitat to the Koala. The contextual value of the vegetation on-site is limited by the presence of existing, under construction and future developments with recognised threats occurring on-site and adjacent.

Table A17: Assessment Unit 1 –Remnant (Least Concern RE12.9-10.2) – MHQA results

Assessment Unit - Regional Ecosystem	AU 1 - Koala habitat RE12.9-10.2					
	RE12.9-10.2 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	6	8	7	7.5	125.00	5
Native plant species richness - shrubs	7	6	6	6	85.71	2.5
Native plant species richness - grasses	7	5	3	4	57.14	2.5
Native plant species richness - forbs	13	3	3	3	23.08	0
Tree canopy height (Canopy)*	21	18	18	18	85.71	5
Tree canopy height (Sub-canopy)*	12	10	10	10	83.33	5
					*Average tree canopy height	5
Tree canopy cover (Canopy)**	64	59.9	68.5	64.2	100.31	5
Tree canopy cover (Sub-canopy)**	20	35.2	20.6	27.9	139.50	5
					**Average tree canopy cover	5
Shrub canopy cover	6	5.6	7.3	6.45	107.50	5
Native grass cover*	21	25	2	13.5	64.29	3
Organic litter*	48	68	86	77	160.42	5
Large trees (euc plus non-euc) (per ha)	38	18	4	11	28.95	5
Coarse woody debris (per ha)	506	159	196	177.5	35.08	2
Non-native plant cover	0	10	3	6.5	6.50	5
Quality and availability of food and foraging habitat	NA				-	10
Quality and availability of shelter	NA				-	10
					Site Condition Score (/100)	70
					Overall Site Condition Score - out of 3	2.10
SITE CONTEXT						
Size of patch	10					10
Connectedness	5					0
Context	5					4

Ecological Corridors	**6**					6
Role of site location to species overall population in the state	**5**					5
Threats to the species	**15**					7
Species mobility capacity	**10**					4
					Site Context Score (/56)	**36**
					Overall Site Context Score - out of 3	**1.93**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**					**40**
					Species Stocking Rate Score (/70)	**40.00**
					Overall Species Stocking Rate Score - out of 4	**2.29**
Overall Assessment Unit Score						**6.31**

Table A18: Assessment Unit 1 – Remnant (Least Concern RE12.9-10.2) – Species Stocking Rate Results

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	40/70
Species Stocking Rate Score – out of 4	**2.29**

***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

4.2. GHFF

4.2.1 Assessment Methodology

The proposal results in the clearing of 7.38 ha of vegetation that is identified as providing suitable foraging habitat for the Grey-headed Flying-fox (refer **Plan A18**). The referral area has been assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by Saunders Havill which adopts characteristics of the Queensland State Governments *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017, 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 (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 GHFF 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 site 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 expected range for a relatively undisturbed community.

The site condition assessment under the GHFF FHA is assessed using six 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.

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 A20** for the benchmark scoring values for this condition characteristic.
- *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. The species richness of canopy trees is the average number of GHFF foraging for the assessment unit (which includes species from the genus *Eucalyptus*, *Corymbia*, *Angophora*, *Melaleuca* and *Syncarpia*). The number or species recorded per transect within the assessment unit is divided by the number of transects to produce an average number of GHFF foraging species. It should be noted that non-GHFF foraging species are also documented. Refer to **Table A21** for the benchmark scoring values for this condition characteristic.
- *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 on nectar productivity of foraging species, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017). Flower scores of foraging species are derived from Table 4.1 of Eby and Law (2008) which calculates the flower score as:

  $$\text{Wt p* r} = (\text{productivity})^{0.7} * (\text{reliability})^{0.3}$$

  Productivity is based on abundance and spatial synchrony and reliability is based on the consistency with which a species flowers from year to year. *Eucalyptus moluccana* was provided a flower score range of 0.35 to 0.65. The flower score of this species was determined as the average value of the range (w p*r = 0.5). The flower scores for each transect are then summed and 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 has 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 A22** for the benchmark scoring values for this condition characteristic.
- *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 Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) 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). Each biological shortage is assigned a bi-monthly period. Bi-monthly flowering phenologies for GHFF foraging species are derived from Table 4.5 of Eby and Law (2008). Winter food resources is considered a limiting factor for GHFFs in South East Queensland (Eby and Law 2008), therefore, winter foraging species such as *E. crebra*, *E. siderophloia* and *C. citriodora* are generally weighted with a higher flower score than other

species. Each biological shortage within 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. Species recorded within transects of each AU are then compared to the bi-monthly flowering phenology and provision of biological shortage and scored against the values in **Table A23**.

- *Quality of foraging habitat* – This condition characteristic is the number of significant GHFF flower species within the site, taken from the 'species richness (canopy trees)' condition characteristic of all vegetation plots. A significant food plant is a species with a weighted flower score of 0.65 or greater, as listed in Table 4.1 in 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 *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017). Refer to **Table A24** for the benchmark scoring values for this condition characteristic.
- *Non-native plant cover* – This condition characteristic overlaps with the on-ground condition characteristics of the Koala MHQA. Refer to **Table A25** for the benchmark scoring values for this condition characteristic.

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 State mapped ecological corridors. Under the GHFF FHA, site context is measured using the following six 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);
- State mapped 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.

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. Refer to **Table A26** for the benchmark scoring values for this context characteristic.
- *Connectedness* – This context characteristic is assessed by counting the number of active GHFF roosts within a 20 km radius of the site. For consistency purposes this assessment utilises the data provided

on the national flying-fox monitoring program (CSIRO Data Access Portal). Refer to **Table A27** for the benchmark scoring values for this context characteristic.

- *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 20 km buffer of the site measured. This context characteristic is measured using GIS. Refer to **Table A28** for the benchmark scoring values for this context characteristic.
- *State Mapped 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 A29** for the benchmark scoring values for this context characteristic.
- *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. Known threatening processes to the GHFF are detailed in the *National Recovery Plan for the Grey-headed Flying-fox 'Pteropus poliocephalus'* (DAWE, 2021). The key threat to GHFF is habitat loss with other threats including camp disturbance, mortality in commercial fruit crops, heat stress, entanglement in netting and barbed wire fencing, climate change, bushfires, electrocution on power lines and public misunderstanding of disease risk. This attribute considers processes occurring on-site that may threaten the species rather than broad processes such as climate change and bushfires. A high level of threat is considered any activity that is currently modifying the habitat on-site or is disturbing an on-site roost. A moderate level of threat is considered any interaction that may be harming or interfering with a GHFF individual such as net entanglement. A low level of threat is the absence of processes that may actively threaten GHFF or a low likelihood that a GHFF may be negatively impacted through interacting with the site. Refer to **Table A30** for the benchmark scoring values for this context characteristic.
- *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 considering the number of active GHFF roost camps level 3 or greater within a 20 km radius of the site and the presence of critical foraging habitat on-site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government). Refer to **Table A31** for the benchmark scoring values for this context characteristic.

Species Stocking Rate (30%)

The GHFF FHA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. As discussed above, species stocking rate 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. The stem density is calculated as the number of foraging tree species stems per hectare.

Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology provided in 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 (0.2 ha) that are classed as foraging species for GHFF. 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 determine the number of stems per hectare or stem density. This number is then compared to the benchmark stem density per ha.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019 - additional description for RE 12.9-10.2 provided by the Queensland Herbarium) and the stem density per hectare associated with the technical description of the regional ecosystem. The RE technical descriptions available through the Queensland Herbarium list the benchmark stem density per hectare for T1 and T2 layers. As the stem count methodology counts trees in both the T1 and T2, the stem densities are summed to produce a combined benchmark stem density for the RE for which on-ground counts are compared to. The benchmark stem densities for each RE is calculated as the sum of T1 and T2 is calculated as 240 per ha for RE12.9-10.2 (refer **Table A19**). Refer to **Table A32** for scoring values for species stocking rate based on the benchmark stem density per hectare.

Table A19: RE benchmark stem density per hectare based on technical descriptions

	Stem density (number of stems per hectare)
	RE12.9-10.2
T1	110
T2	130
Total	240

Table A20: GHFF FHA Vegetation Condition Scoring

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

Table A21: GHFF FHA Canopy 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 A22: GHFF FHA Flower Score (average) Scoring

Score	Description
2	0.01 – 0.25
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00

Table A23: GHFF FHA Timing of Biological Shortages Scoring

Score	Description	Timing
2.5	Food shortages	July - September
1.5	Pregnancy and birthing	July - November
1.5	Lactation	October - March
1.5	Mating and conception	December - May
1.5	Migration paths	All year
1.5	Fruit industries	August - March
Total (/10)	Combine total of above	NA

Table A24: 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 A25: 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

Table A26 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 A27: 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 A28: 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 A29: GHFF FHA State Mapped 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 A30: Threats to species (GHFF) 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 A31: Role of site location to GHFF overall population in the State scoring

Score	Description
1	1 – 2 active level 3 Grey-headed Flying-fox camp within a 20 km radius
6	3 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 5 active level 3 Grey-headed Flying-fox camp within a 20 km radius

Table A32: GHFF Species Stocking Rate Scoring

Score	RE12.9-10.2 (AU1)
2	0 – 32
4	33 – 137
6	138 – 232
8	233 – 248
10	249 – 258
8	259 – 274
6	275 – 369
4	370 – 474
2	>475

Source – Queensland Herbarium Regional Ecosystem Technical Descriptions https://www.publications.qld.gov.au/dataset/re-technical-descriptions/resource/1771f391-44b9-4d25-8315-f92033610a9b

4.2.2 Discussion

Results of the GHFF FHA using methodology detailed in **Section 4.2.1** are shown in **Table A33**.



Table A33: GHFF FHA

Assessment Unit - Regional Ecosystem	AU 1 habitat patches - RE12.9-10.2				
Site Reference	Transect 1	Transect 2	Average	AU Score	OUT OF
	Raw Data	Raw Data	Score		(X/X)
Vegetation Condition	Cat B (20)	Cat B (20)	20.00	20	20
Species Richness	6.0	5.0	5.50	10	20
Flower Score	0.623	0.638	0.6305	8	10
Timing of Biological Shortages	All biological shortages covered by species on-site	All biological shortages covered by species on-site	10.00	10	10
Quality of Foraging Habitat	4	4	3.00	10	20
Non-native Plant Cover	10.00	3.00	6.50	10	20
Site Condition Score				68	*X*
MAX Site Condition Score				*100*	*X*
Site Condition Score - out of 4				2.72	*X*
Size of patch	10	10	10	10	10
Connectedness	6	6	6	6	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	10	10	10	10	10
Site Context Score				43	*X*
MAX Site Context Score				*60*	*X*
Site Context Score - out of 3				2.15	*X*
GHFF Foraging Tree Density - Recorded	59	42	50.50		
GHFF Foraging Tree Density - per hectare	295	210	252.50	8	10
Species Stocking Rate Score				*8*	*X*
MAX Species Stocking Rate Score				*10*	*X*
Species Stocking Rate Score - out of 3				2.4	*X*
Total				7.27	

4.3. South-eastern Glossy Black-Cockatoo

The South-eastern Glossy Black-Cockatoo was identified in the desktop assessment of the original referral material as a threatened species which has the potential to be impacted by the proposed development due to the potential for suitable habitat.

Following field surveys, the species was downgraded to a 'low' likelihood of occurrence based on several factors. Firstly, a review of existing publicly available databases returned no records of the species within 5km of the site with the nearest records being approximately 9km east. These records are both dated (1975) with the nearest contemporary records approximately 11.5km east, associated with White Rock Conservation Park and surrounding vegetation. Secondly, on-ground surveys confirmed that potential foraging habitat (*Allocasuarina* or *Casuarina* species) were largely absent and confined to a few scattered individual specimens. It is widely acknowledged that the species has a highly selective foraging diet and will favour specific specimens over others of the same species. Therefore, the suitability of the habitat and likelihood of occurrence is directly correlated to the abundance of suitable foraging species. Clusters of suitable foraging trees are not present within the referral area and therefore have not been mapped. The lack of suitable foraging habitat coupled with the small overall referral area (7.52ha) indicates it is highly unlikely that the species would forage within scattered individual *Allocasuarina*.

Suitable breeding habitat for the species is related to the availability of large deep hollows. Hollows ≥150mm diameter are present as nine (9) hollow bearing trees (refer **Plan A15**). The likelihood of these hollows being utilised by the species is limited by the lack of foraging habitat in close proximity as the species will commonly nest close to a dense stand of suitable foraging specimens. Furthermore, the species is likely to revisit suitable foraging areas annually. Given there are no records of the species in proximity to the site and the species was not observed on-site, it is considered highly unlikely the species would occur (refer **Plan A10**).

Significant Impact Assessment

A significant impact assessment was not completed as part of the original referral material due to the low likelihood of occurrence assessment. This PD RFI, states there is potential for a significant impact on the species and therefore a significant impact assessment has been provided (refer **Table A31**). The conclusion of this assessment was that it was deemed highly unlikely that South-eastern Glossy Blac-Cockatoo would utilise the referral area based on no evidence of the species on-site, no local records and lack of suitable habitat. Furthermore, the context of the small 7.52 referral area surrounded on all sides by current and future development indicates that removal of low value habitat for the species is unlikely to have a significant impact on the species.

Table A34: Significant impact assessment – South-eastern Glossy Black-Cockatoo (Vulnerable)

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population	Foraging habitat for the South-eastern Glossy Black-Cockatoo is characterised by dense stands of *Casuarina* or *Allocasuarina* species. Field surveys identified the referral area to consist of only sparsely scattered individual *Allocasuarina luehmannii* specimens which is not the common food tree for the species in SEQ (*Allocasuarina littoralis* and *Allocasuarina torulosa*). The small referral area and lack of foraging specimens indicates extremely limited foraging habitat for the species. Nine (9) hollow bearing trees were recorded across the referral area which contained hollows broadly considered suitable for the species (i.e ≥150mm diameter) (refer **Plan A15**). However, the context of the site has to be considered when assessing the suitability of habitat. The conservation advice states that hollows utilised by the species are mostly within 1km of suitable feed trees and within 200m of permanent water. The referral area does not contain suitable foraging habitat for the species and much of the surrounding area has progressed from rural to urban with minimal vegetation retention. Suitable habitat for the species is known to be present within large areas of intact remnant vegetation associated with White Rock Conservation Park and surrounding areas. As such, hollows within the referral area are of limited value to the species. No evidence of a population exists within the referral area, nor were any individuals observed during field surveys. It is not anticipated that a population would occur within the vegetation on-site given the absence of suitable foraging and limited breeding habitat to support the species. Thus, it is considered highly unlikely that the proposed development will lead to a long-term decrease in the size of an important population.	**Significant impact not likely**
Reduce the area of occupancy of an important population of the species	Despite the referral being mapped as remnant vegetation, a review of historical aerial imagery and on-ground surveys identified partial clearing, and selective logging as having occurred, ultimately reducing the number of very large trees that would be reflective of this community. Large trees are required to provide suitable large hollows for the species. Most hollows recorded on-site are within dead stag trees that form hollows earlier than living trees of the same size. Furthermore, contemporary surveys did not locate any dense stands of *Allocasuarina* or *Casuarina* specimen required by the species.	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
	While hollows recorded on-site have potential to be utilised by the species, the context of the small referral area amongst largely urban areas with extremely minimal foraging resources indicates it is highly unlikely the species would utilise the hollows on-site. Furthermore, the species was not observed on-site and a review of existing publicly available databases returned no records of the species within 5km of the site with the nearest records being approximately 9km east. These records are both dated (1975) with the nearest contemporary records approximately 11.5km east, associated with White Rock Conservation Park (refer **Plan A10**). The removal of vegetation on-site which provides extremely minimal foraging habitat and limited roosting habitat is not considered to have a significant impact on the species. There is no evidence that the species utilises limited vegetation on-site and therefore the proposed action is not considered to reduce the area of occupancy of an important population of the species.	
Fragment an existing important population into two or more populations	It is highly unlikely that the proposed project will result in fragmentation of an existing important population as the site is highly isolated by roads and existing/future urban development. Vegetation within the referral area does not provide the necessary foraging resources that are required by the species with only very limited breeding habitat in the form of several dead stags. Additionally, historical records and contemporary surveys have not recorded the species on, or within 5km of the site. Therefore, it is highly unlikely the proposed development will result in the fragmentation of an existing important population into two or more populations.	**Significant impact not likely**
Adversely affect habitat critical to the survival of a species	The *Conservation Advice for Calyptorhynchus lathami lathami (South-eastern Glossy Black-cockatoo)* (DCCEEW 2022b) defines habitat critical to the survival of the species as areas: - For activities such as foraging, breeding, roosting or dispersal; - For long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators); - To maintain genetic diversity and long term evolutionary development; - For the reintroduction of populations or recovery of the species or ecological community. As mentioned previously, the referral area lacks suitable foraging and breeding habitat to support the species on account of the small referral area, lack of foraging specimens and lack of large hollow bearing trees.	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
	Foraging habitat for the South-eastern Glossy Black-cockatoo is characterised by dense stands of *Allocasuarina* species. Field surveys identified the referral area to not contain *Allocasuarina* or *Casuarina* stands with only sparsely scatted individual specimens of *Allocasuarina luehmannii* (not considered to preferred food tree in SEQ). Potentially suitable hollows were observed within dead stag trees on-site however, these again are limited by the overall small referral area of 7.52 ha. Given the site is completely surrounded by roads and residential lots, dead stag trees that are located near the boundary of the site pose a potential health and safety risk to people and property and may require removal. The referral area does not offer suitable foraging or breeding habitat which could support an important population of South-eastern Glossy Black-cockatoo. The lack of habitat within and adjoining the referral area is reflected in the lack of records within 5km of the site with the nearest being approximately 9km east. These records are both dated (1975) with the nearest contemporary records approximately 11.5km east, associated with White Rock Conservation Park and Flinders-Goolman Conservation Estate (refer **Plan A10**). Portions of these vegetation patches have been identified by the State Government as containing areas of potential or known habitat for the species. These areas are far more likely to offer habitat that would contribute to the long-term maintenance of the species than the site. Given the referral area does not offer suitable foraging or breeding habitat for the species coupled with a general lack of records and surrounding habitat, the project is highly unlikely to adversely affect habitat critical to the survival of a species.	
Disrupt the breeding cycle of an important population	The site does not contain any suitable foraging in the form of dense stands of *Allocasuarina* or *Casuarina* species. Nine (9) hollow bearing trees were recorded across the referral area, mostly as dead stag trees, which have potential to be utilised by the species (refer **Plan A15**). Although potentially suitable hollows were recorded within the referral area, these are within a small, highly isolated vegetated patch. Foraging habitat and permanent water on, and adjacent, to the referral area is limited which reduces the likelihood of hollow bearing trees on-site being used. Additionally, several of these dead hollow bearing trees are in close proximity to residential developments to the north where they pose a potential risk to property and may require removal.	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
	Detailed field surveys over multiple days did not detect any evidence of a population of South-eastern Glossy Black-cockatoo utilising the referral area, and there are no records within 5km of the referral area with confirmed sightings located within White Rock Conservation area and adjacent intact vegetation. Given the lack of suitable habitat to support the species and general limited presence within the local area it is considered highly unlikely that the project will disrupt the breeding cycle of an important population.	
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The referral area is a small, highly isolated vegetated patch centrally located within RVPDA. Field surveys did not identify suitable foraging habitat for the species due to a lack of *Allocasuarina* and *Casuarina* specimens, of which this species relies on for foraging. Nine (9) hollow bearing trees, predominantly dead stags, were recorded which contained hollows that are broadly suitable for the species (≥150mm diameter) (refer **Plan A15**). However, the suitability of these hollows as breeding habitat is limited by the context of the site and lack of foraging habitat in the vicinity. Foraging habitat is present within large areas of connected vegetation to the south-east of the site where confirmed records are present. Furthermore, the species was not observed on-site and there are no records within 5km of the referral area. As the referral area does not contain significant breeding or foraging habitat to support this species, the proposed action is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Significant impact not likely**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive flora and fauna species are not listed as a major impact to South-eastern Glossy Black-cockatoo under their conservation advice. The referral area is highly isolated and is not located adjacent to any area of retained vegetation. It is unlikely the proposed development would introduce an invasive species that would lead to harm to the South-eastern Glossy Black-cockatoo or its habitat.	**Significant impact not likely**
Introduce disease that may cause the species to decline	Psittacine Beak and Feather Disease (PBFD) is known to affect the South-eastern Glossy Black-cockatoo. However, as this already exists among Glossy Black-cockatoo populations, it is unlikely the proposed development would introduce disease that would harm the Glossy Black-Cockatoo. This is particularly so as the	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
	referral area currently lacks any suitable habitat and therefore is unlikely to attract any South-eastern Glossy Black-cockatoos to the area where disease could spread.	
Interfere substantially with the recovery of the species	Several conservation and management priorities have been identified in the *Calyptorhynchus lathami lathami* Conservation Advice. Some of these management priorities include protecting, restoring and enhancing the quality of known suitable habitat and increasing its extent, establishing buffer zones around native forests or woodlands, protecting large old trees and maintaining connectivity between regions. As discussed in the above points, detailed field surveys did not identify suitable foraging or breeding habitat for the species nor was any evidence of the species utilising the referral area observed. Records and known suitable habitat for the species occurs >5km east of the referral area associated with White Rock Conservation Park. It is therefore considered highly unlikely that the project will interfere substantially with the recovery of the species as it is considered unlikely the referral area in its current state could support the species in any capacity.	**Significant impact not likely**

No adopted or made Recovery Plan exists for this species however the *Conservation Advice for Calyptorhynchus lathami lathami (South-eastern Glossy Black-cockatoo) 2022* lists conservation and recovery actions and management priorities. The primary conservation objectives for these actions are:

- The subspecies' population is stable, such that it no longer qualifies for listing as threatened under the EPBC Act listing criteria. (**Long-term objective, 10+ years**);
- Protect, enhance extent and quality of habitat across the subspecies' range;
- Address critical knowledge gaps of the subspecies' ecological needs to guide and refine management strategies; and
- Enhance community awareness and stewardship of the conservation of the subspecies.

The objectives are split into the current and most significant threats to the species;

- Clearing of native vegetation/timber harvesting and habitat fragmentation
- Inappropriate fire regimes
- Competition for nest hollows

The following addresses these management priorities and how the action proposes to fulfil these objectives.

Protect, restore and enhance the quality of known suitable habitat and increase the extent of habitat (both breeding and foraging) for South-eastern Glossy Black-cockatoo across the subspecies' range (both current and future) to maintain viability in response to threats, including climate change.

The referral area is a small highly isolated vegetated patch that lacks the specific habitat requirements for the species. Foraging habitat is largely absent with the exception of a handful of scattered *Allocasuarina* specimens. Potential breeding habitat is limited to several dead stag trees that contain hollows. However, the lack of suitable foraging habitat in the region limits the likelihood that these hollows would be utilised by the species. Several of these dead stags are located along the northern boundary of the site where residential developments are present and thus pose a risk to properties and are potentially compromised.

Thus, this conservation action cannot occur under the referral context of the referral area and lack of suitable habitat does not support the species.

Establish appropriate buffer zones (e.g., 1 km) of native forests or woodlands around important nesting areas to minimise incursions by competitors.

Areas identified as known or potential habitat to support this species are not mapped within the vicinity of the referral area. The areas identified to contain suitable habitat within the local region are largely associated with the White Rock Conservation Area to the east and Flinders-Goolman Conservation Estate to the south. Surrounding land uses to the referral area are either developed, in the process of being developed or likely to be developed in the future under the Ripley Valley PDA Development Scheme. The high level of existing fragmentation and lack of foraging habitat means land within and surrounding the referral area is unlikely to provide an important nesting areas now or in the future. A buffer zone is not required for this project.



Protect large old trees and smaller trees that contain large hollows, including those affected by fires. Ensure the recruitment of large old trees by retaining medium-sized trees, facilitating regeneration, and undertaking replanting.

The referral area generally lacks large trees that would be typical of remnant vegetation through historic selective clearing. The referral area only meets 29% of the large tree threshold as defined under the BioCondition assessment tool. Field surveys did identify hollow bearing trees on-site however these were predominantly dead stag trees that form hollows readily. Notably, several of these hollow bearing trees are located adjacent to the northern boundary of the site where adjacent high density residential properties are present. Given the referral area and surrounding area is zoned as urban living under the RVPDA it is not unlikely that these dead stag trees will require removal given the risk to property and people. In Ipswich City Council, trees that present a risk to people of property can be removed with an approval.

Given the proposed action occurs within the RVPDA with the surrounding lots also proposed for urbanisation the retention of the hollow bearing trees on-site is not considered an appropriate action for the conservation of this species. Particularly when considering the site is currently not utilized by South-eastern Glossy Black-cockatoo due to the absence of foraging habitat and very limited breeding capacity.

Maintain connectivity within and between regions:

- **At a local scale, ensure that birds can move safely between food, water and roosting resources via corridors that provide cover in the form of woodland or forest vegetation.**
- **Identify regional corridors that connect inland populations with those along the Great Dividing Range and the coast.**
- **Enhance or restore regional corridors through strategic revegetation and other works that ensure the availability of food, shelter and water resources.**

The referral area is a small, highly isolated vegetated patch located centrally within RVPDA. All land surrounding the referral area is zoned as urban living and is intended to be development, with roads and lots already complete. The referral area was not intended contribute to any regional corridors that are present further to the south-east where large area of intact retained vegetation area present. The referral does not provide any corridor functionality at present due to a lack of suitable habitat and lack of connected vegetation. There are no records of the species on, or within 5km of the referral area nor was the species recorded during contemporary site surveys. Thus, there is no evidence that an existing population would utilise the referral area given the lack of suitable habitat for foraging or breeding and context of the site.

Ensure the year-round availability of surface water in close proximity to foraging and nesting habitat. Where necessary, install or maintain artificial water recourses to ensure continued access to food and nest sites during periods when natural surface water is absent.

The referral area does not contain suitable foraging or breeding habitat that could support this species. Therefore, installation of artificial water sources as part of project design is not considered necessary to support this species. The areas of potential and known habitat occur south-east of the referral area and are



likely supported by Bundamba Lagoon, a large permanent waterbody 10 km south-east of the site that is situated close to several records of South-eastern Glossy Black-cockatoo.

Maintain vegetation in proximity to water points, including the presence of smaller trees immediately adjacent to the water's edge, to provide cover and resting place for drinking birds.

A single small, constructed dam is present within the referral area, which I otherwise surrounded by urban development. Therefore, this waterbody is not considered important water sources for South-eastern Glossy Black-cockatoo within the region, particularly with Bundamba Dalys Lagoon available. It is not considered in the best interests of public safety to retain these farm dams within the rapidly urbanising area.

Identify important populations and engage stakeholders in the development and implementation of a local area management plan (a map-based document detailing the works necessary to secure the long-term viability of the population). Undertake baseline studies to support the preparation of these management plans.

As discussed throughout the significant impact assessment for South-eastern Glossy Black-cockatoo, no important populations of this species are expected to occur on-site, nor does the referral area contain suitable habitat which could support this species.

Develop or improve forestry policies across the range of the subspecies that promote the retention and recruitment of old hollow-bearing trees and other important habitat for the South-eastern Glossy Black-cockatoo.

The proposed action is not a forestry activity.

Promote and encourage revegetation programs or groups to include a Allocasuarina/Casuarina mix in their planting, where appropriate.

There is potential for landscaping of the proposed development to utilise Allocasuarina and/or Casuarina species within plantings where considered appropriate which would offer opportunistic foraging resources. However, based on records of the species and the current lack of suitable habitat within the referral area it is considered unlikely the species would readily occur within the area.

4.4. Swift Parrot

Swift parrot was identified in the desktop assessment as a threatened species which has the potential to be impacted by the proposed development due to the potential for suitable habitat. Field surveys found the habitat on-site to be largely unsuitable for this species.

Foraging habitat for the swift parrot on the Australian mainland is defined in the National Recovery Plan for the Swift Parrot (2024) as all preferred foraging species within known and likely foraging habitat on the mainland including Yellow Gum (*E. leucoxylon*); Red Ironbark (*E. tricarpa*); Mugga Ironbark (*E. sideroxylon*); Grey Box (*E. macrocarpa*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Forest Red Gum (*E. tereticornis*); Blackbutt (*E. pilularis*); and Spotted Gum (*Corymbia maculata*).

Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38. In addition to the lack of mature trees, only 5 of the 74 large trees located on site were preferred foraging species for swift parrot, being *E. tereticornis*.

The Recovery Plan identifies that due to the variable production of nectar and lerps across this species' range, it is considered important to protect and manage a broad range of habitats to provide a range of foraging resources. It should be noted that the two studies referenced by this statement (Kennedy and Overs 2001; Kennedy and Tzaros 2005) were completed in southern NSW and Victoria respectively where key biodiversity areas (KBAs) are located for the species. Many of the Swift Parrot foraging sites in Queensland occur on council reserves or parkland which will not be disturbed as part of the action.

As detailed in **Section 3.2.1**, the Swift Parrot prefer larger diameter foraging trees as they are more productive nectar sources. Analysis of the transect data indicates that the average number of trees per ha equal to or greater than the large tree benchmark for RE12.9-10.2 is 11 for the referral area. The benchmark for number of large trees per hectare for RE12.9-10.2 as per the benchmark guideline is 38, measured at 380 mm DBH or greater. As such, the vegetation community within the proposed action area meets only 25.9%, of the large tree benchmark for RE12.9-10.2.

There are no records of the species within the locality with the closest record approximately 8km west of the referral area. Notably, given this species is Critically Endangered, the location of recorded sightings are generalised to 10km. There is no date assigned to this record.

Habitat critical to the survival of the Swift Parrot on the mainland contains the preferred foraging species listed above. Only five mature specimens of the preferred habitat species are present on site. The global KBA partnership currently recognises 18 KBAs as important for Swift Parrot conservation and to support the long-term persistence of the species. It is essential that protection is provided to these areas and that enhancement and restoration measures target these productive sites. No swift parrot KBAs are present in Queensland with closest located several hundred kilometres south the of Queensland border near Port Macquarie (Hastings-Macleay KBA).



Based on this assessment, the site is considered to contain limited preferential foraging habitat due to the lack of abundance of large trees and preferred foraging species. The site contains a low percentage of trees defined as 'large' under the benchmark, indicative of selective clearing that has occurred throughout the referral area. Due to the absence of large, more productive specimens, it is unlikely that the vegetation on-site would form critical foraging habitat for the Swift Parrot.

Significant Impact Assessment

A significant impact assessment was not completed as part of the original referral owing to lack of records of the species and lack of potential habitat within the referral area. However, following this PD information request, a significant Impact Assessment has been provided.

Table A35: Significant impact assessment – Swift Parrot (Critically Endangered)

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population	The species was not identified on-site nor as fly-over during field survey effort. Limited key foraging species were recorded across the site, as well as preferred, mature species where limited across the site due to historical modification. In South East Queensland, preferred species considered to provide potentially suitable foraging habitat include *Eucalyptus macrocarpa, Eucalyptus albens, Eucalyptus melliodora, Eucalyptus robusta, Eucalyptus tereticornis, Eucalyptus pilularis* as well as *Corymbia citriodora*. Field surveys recorded only *Corymbia citriodora* and *Eucalyptus tereticornis* on-site. The closest record of the species is located approximately 8 km to the west of the referral area which has no associated date. Due to the sensitivity of the species, public data bases were used, and the exact location is not released. Overall, larger trees were lacking across the impact area due to the historic clearing that has occurred. It is known that the species have a preference for foraging in large, mature trees. Hence, the availability of preferred habitat within the impact area is limited. Given the superior mobility capacity of the species, and abundance of preferential habitat in the wider locality, the significance of foraging habitat on-site is considered marginal. This is further supported by the National Recovery Plan for the Swift Parrot which states "*Many of the Swift Parrot foraging sites in Queensland occur in council reserves or parkland. The Regional Ecosystems containing preferred Swift Parrot forage tree species have been mapped and overlaid for the recorded areas of Swift Parrots in Queensland*". This mapping is not present on-site. The action is not considered to lead to a long-term decrease in the size of a population, and a significant impact as a result of the proposed action is not likely.	**Significant impact not likely**
Reduce the area of occupancy of the species	The species was not identified on-site during field survey events. Further, the closest record is located approximately 8 km to the west of the which is undated and has a 10km positional uncertainty. Swift Parrots are known to consistently occupy breeding habitat in Tasmania and utilises habitat in Queensland opportunistically. The impact area is small and located within a locality surrounded by urban developments. Given the availability of intact vegetation within the wider locality, associated with White Rock Conservation Area approximately 10km to the east. The species is highly mobile and is likely to move to where preferential habitat exists. Therefore, the action will not reduce the area of occupancy of the species.	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
Fragment an existing population into two or more populations	The species was not identified on-site during extensive field surveys. As previously discussed, the closest record of the species is located approximately 8km to the west. Given the mobility of Swift Parrot, and the abundance of preferential habitat within the greater landscape, the action will not fragment an existing population into two or more. A significant impact is not considered to result from the proposed action.	**Significant impact not likely**
Adversely affect habitat critical to the survival of a species	The potential for the vegetation within the referral to be considered critical habitat was assessed in the above subsection. The National Recovery Plan for the Swift Parrot broadly defines critical habitat as areas of priority habitat for which the Swift Parrot has a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot, or are otherwise identified by the recovery team. As previously discussed, the site contains limited preferred foraging species, limited to *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia citriodora* (Spotted Gum) as well as lacking mature, large specimens that are considered to be more productive that smaller, juvenile species. Given the small referral area, lack of foraging habitat and mobility of Swift Parrot, the action will not adversely affect habitat critical to the survival of the species. A significant impact is not considered to result from the proposed action.	**Significant impact not likely**
Disrupt the breeding cycle of a population	The Swift Parrot breeds in Tasmania during the austral summer. Therefore, the proposed action will not disrupt the breeding cycle due to the location of the action being located in Queensland.	**Significant impact not likely**
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The species was not identified on-site during field survey events. Further, as previously discussed, the site retains limited foraging habitat for the species, lacking large mature specimens that are more productive. Given the limited foraging habitat and the superior mobility capacity of the species and abundance of preferential habitat within the wider locality, the action is not considered to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	**Significant impact not likely**
Result in invasive species that are harmful to a critically endangered or	The proposed action is unlikely to result in the introduction of invasive species, and therefore no significant impact is considered to result from the proposed action.	

Significant Impact Criteria	Assessment	Impact
endangered species becoming established in the endangered or critically endangered species' habitat		
Introduce disease that may cause the species to decline	The project is unlikely to introduce disease into the area, and therefore no significant impact is considered to result from the proposed action.	**Significant impact not likely**
Interfere with the recovery of the species.	The recovery of the Swift Parrot is focused on identifying and managing habitat at a landscape scale and monitoring and managing competition and disease, particularly within their breeding habitat in Tasmania. The proposed action is not considered to interfere with the recovery of the species because the habitat on-site is not considered significant, particularly at a landscape scale given it is not recognised within Queensland Government mapping. Further, preferential habitat exists in the wider locality within larger tracts of intact remnant vegetation, including White Rock Conservation Park which is reflected in the zoning intent of RVPDA. The proposed action area is not considered to provide preferential habitat. Therefore, no significant impact is considered to result from the proposed action.	**Significant impact not likely**

4.5. Regent Honeyeater

Regent Honeyeater was identified in the desktop assessment as a threatened species which has the potential to be significantly impacted by the proposed development. Field surveys found the habitat on-site to be largely unsuitable for this species.

Broadly, the National Recovery Plan for the Regent Honeyeater (Department of the Environment 2016) lists Critical Habitat for the Regent Honeyeater as:

- Any breeding or foraging areas where the species is likely to occur.
- Any newly discovered breeding or foraging locations.

To ascertain the potential for Regent Honeyeaters to forage within the referral area, an assessment of preferred foraging species has been completed.

The Regent Honeyeater's preferred food species include:

- *Eucalyptus sideroxylon* (Mugga (or Red) Ironbark)
- *Eucalyptus melliodora* (Yellow Box)
- *Eucalyptus albens* (White Box)
- *Eucalyptus leucoxylon* (Yellow Gum)
- *Corymbia maculata* (Spotted Gum)
- *Eucalyptus robusta* (Swamp Mahogany)
- *Amyema cambagei* (Needle-leaf Mistletoe) on *Casuarina cunninghamiana* (River She-oak)
- *Amyema miquelii* (Box Mistletoe)
- *Dendropthoe vitellina* (Long-flower Mistletoe)

In general, the Regent Honeyeater diet consists of nectar that is obtained chiefly from eucalypts and mistletoe, and Regent Honeyeaters appear reliant on select species which provide reliable nectar flows. The species are known to prefer taller and larger diameter trees for foraging, as these typically produce more nectar (National Recovery Plan for the Regent Honeyeater, 2016). In addition, fruit and invertebrates (primarily insects) as well as their exudates also form part of the Regent Honeyeater diet (DoE 2016).

The National recovery plan for the regent honeyeater notes that most records of regent honeyeaters come from box-ironbark eucalypt associations, where the species seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. Other forest types regularly utilised by regent honeyeaters include wet lowland coastal forest dominated by swamp mahogany (*Eucalyptus robusta*), spotted gum-ironbark associations and riverine woodlands. The referral area does not contain any waterways or wet lowland forest that would provide critical habitat for the species.



The recovery plan also lists key tree and mistletoe species for the regent honeyeater, which include Yellow Gum (*E. leucoxylon*); Mugga Ironbark (*E. sideroxylon*); White Box (*E. albens*); Yellow Box (*E. melliodora*); Swamp Mahogany (*E. robusta*); Spotted Gum (*Corymbia maculata*); Needle-leaf Mistletoe (*Amyema cambagei*) on River Sheoak; Box Mistletoe (*A. miquelii*); and Long-flower Mistletoe (*Dendropthoe vitellina*). None of these species were identified in the referral area.

In addition to preferred habitat, the recovery plan also identifies key areas regularly used by regent honeyeaters as habitat critical to the species survival. Regularly used areas include Bundarra-Barraba, Hunter Valley, Capertee Valley and Chiltern. All of these areas are located several hundred kilometres from the referral area.

The recovery plan states that mature, large individual trees tend to be more important as they are more productive, particularly on highly fertile sites and in riparian areas. As previously noted, the referral area does not contain any waterways or riparian areas. Surveys recorded 74 trees (excluding dead/stag trees) with a DBH ≥380mm, which is considered the threshold for large trees in this regional ecosystem, across the referral area. This equates to 9.84 mature trees per hectare, which is 25.9% of the habitat quality benchmark of 38, therefore would not be considered high value habitat for regent honeyeater. No mistletoe was observed on site.

Additionally, Regent Honeyeaters experience competition from aggressive species such as Noisy Miner (*Manorina melanocephala)*. Noisy Miners were observed within the referral area on multiple occasions reducing the likelihood potential for Regent Honeyeaters to opportunistically forage on-site.

A combination of a lack of local records, limited foraging resources and small overall impact area concludes that the proposed development is highly unlikely to have a significant impact in the species.

Regent Honeyeater movements have a large variability in timing and patterns between years relating to the patterns in flowering key species. As previously discussed in **Section 3.3.3.5** and demonstrated in **Plan A11** records of the species exist approximately 5 km to the southeast. However, this record retains a spatial uncertainty of 2km due to the sensitivity of the species. While the exact location of this record is not publicly available, regardless, it is not considered likely that the species would utilise the referral area due to the lack of suitable foraging habitat. As such, the site is not considered to contain critical habitat for the species.

Significant Impact Assessment

A significant impact assessment was completed and provided as part of the original referral material (refer **Part B**). The conclusion of this assessment was that it was deemed highly unlikely that the proposed action will have a significant impact on Regent Honeyeater. The referral area does not contain preferred foraging habitat for regent honeyeater with values further reduced due to the dominance of aggressive native bird species likely to outcompete vagrant Regent Honeyeater and the presence of larger, more contiguous habitat present in the broader locality.

4.6. Greater Glider

Greater Glider was identified in the desktop assessment as a threatened species which has the potential to be impacted by the proposed development due to the potential for suitable habitat.

Field surveys found the vegetation within the referral area may be broadly viewed as habitat critical to the survival of the species as per the conservation advice namely eucalypt woodland containing suitable foraging species. However, detailed site and context assessments identified a lack of specific habitat features as well as highly isolated context.

While habitat on site could potentially meet the definition of habitat critical to the survival of the Greater Glider as per the conservation advice, it is important to consider its relative habitat quality and factors that may diminish the relative suitability of the site to support Greater Glider now and into the future. The following discussion provides context around relative suitability of the site for the species and supports the conclusion that significant impacts on the species are not likely.

Plan A3 shows current and future developments and roads surrounding the referral area on all sides. While the referral area is mapped as 'remnant' vegetation under the *Queensland Vegetation Management Act 1999*. It is evident on-ground that the referral area has been subject to historical clearing in the 1970's and 1980's with selective logging occurring more recently (refer **Plan A2**). Of note, the Queensland Government defines Remnant Vegetation as meeting 70% of height and 50% of cover of the regional Ecosystem benchmarks, and does not imply never cleared, rather it harbours trees that might meet remnant thresholds against the expected benchmarks for height and cover at the GIS scale. This is apparent in the general lack of old growth trees with hollows recorded on the site (**Plan A20**). Additionally, hollows recorded within the referral were almost exclusively recorded within dead stag trees which form hollows quicker than living trees of the same size.

Notably, the nearest records for the species are approximately 14km south-east within retained areas adjacent to White Rock Conservation Park (refer **Plan A12** and **Plan A21**). This area is separated from the referral area by several major roads, including the Centenary Highway and highly trafficked Ripley Road, as well as several existing and future large-scale developments associated with RVPDA. The referral are does not exist within contiguous remnant vegetation. This is further apparent in mapping by Griffth University, Queensland, of relative forest age that shows the vegetation of the site is considered mostly 'young-intermediate' aged vegetation, with surrounding veg largely the same as well as areas of "young" vegetation and some minor patches of 'intermediate to mature' aged vegetation (Refer **Plan A22**).

The referral area was surveyed for Greater Glider utilising targeted nocturnal searches as per the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* and *Survey guidelines for Australia's threatened mammals*. Given the limited size of the referral and the ease at which Greater Glider are detected using high powered spotlights, the lack of recorded individuals indicates high confidence that the referral is not currently utilised by Greater Glider individuals or a population.

In addition to the lack of individuals identified, the site is significantly fragmented from surrounding vegetation patches by existing and ongoing staged development, including EPBC Act approved residential developments. A detailed analysis of existing and future fragmentation of properties immediately surrounding the referral area is included in **Section 3.1** and shown on **Plan A23**. In summary:

- Properties adjoining the eastern and northern boundaries of the referral area have been cleared and are currently being developed with low density housing.
- The property adjoining the western boundary has all the required approvals (including an NCA decision under the EPBC Act) and is in the process of staged development which will remove all vegetation along the boundary with the referral area.
- Daleys Road is situated between the referral area and the western property including a two-way road and large pedestrian track creating a 30m cleared corridor. The Binnies Road reserve is located adjacent to the southern boundary with areas to the east and west already constructed.
- The property immediately south of Binnies Road has lodged an application for residential development and is currently working through that process. Vegetation on this property has been mapped as 'young to intermediate' by Griffith University therefore is unlikely to provide habitat for Greater Glider.

Potential habitat values for the greater glider in the referral area have been assessed against the Queensland Government's Guide to greater glider habitat in Queensland. Assessment outcomes for the referral area include:

- Tree species characteristic of greater glider habitat are present on site. This includes *Corymbia citriodora* and *Eucalyptus tereticornis*.
- The guide identifies that, on average, trees greater than 500mm DBH appear to be important for greater glider use although denning has been observed at low frequencies in trees with DBHs between 300mm and 400mm. As noted in many other sections of this document, field surveys found large or mature trees (DBH ≥380mm) were sparse with only approximately 10 per ha.
- Greater gliders demonstrate relatively small home ranges < 3 ha throughout their geographic range. The closest recorded observation of a greater glider was 13.6 km from the site, well outside the likely movement of any individual.
- Targeted ground-based hollow searches were carried out in the referral area which identified less than 2 hollows per ha within the referral area (refer to section 3.4.6). As previously noted, studies indicate ground-based surveys may underestimate number of hollows but also overestimate useful hollows for fauna. Due to variability in the assessment of hollows across observers the guide to greater glider habitat in Queensland recommends using large trees with a DBH > 460mm as a surrogate. Field surveys found 56 trees with a DBH > 460mm across the referral area. That is approximately 7.5 per ha. While above the threshold of 2-4 hollows per 2 ha outlined in the conservation advice, this still represents a low density of hollows and mature trees for the regional ecosystem.

Considering the above, while the referral area provides some potential habitat for the greater glider the low density of large trees and hollows as well as significant fragmentation in the surrounding areas means it is unlikely to provide critical habitat for the species now or in the future.

Significant Impact Assessment

A significant impact assessment was completed and provided as part of the original referral material (refer **Part B** of this PD). The conclusion of this assessment was that it was deemed highly unlikely that greater glider would utilise the referral area based on no evidence of the species on-site, no local records and lack of connectivity potential as a result of surrounding developments and roads. Furthermore, vegetation within the referral area was deemed unsuitable due to a lack of specific habitat requirements (hollow bearing trees) and small overall area of 7.52 ha. It is therefore considered highly unlikely that the proposed development will have a significant impact on these species.

4.7. South-eastern Yellow-bellied Glider

The South-eastern Yellow-bellied Glider was identified in the desktop assessment as a threatened species which has the potential to be impacted by the proposed development due to the potential for suitable habitat.

The referral area contains potential South-eastern Yellow-bellied Glider habitat, in the form of eucalypt woodland. Field surveys found that key habitat features for this species are not present in the referral area including:

- No trees with a DBH greater than 1 m are present with the largest tree 15 cm too small. The number of mature trees and hollows in the referral area are generally low with approximately 10 large trees per ha and less than two hollows per hectare.
- Vegetation on site has been classified as young to intermediate maturity by Griffith University (refer to **Plan A22**) and not the mature old growth forest preferred by the species.
- The referral area is approximately 7.5 ha and exists within a highly fragmented landscape including existing and ongoing residential development and infrastructure upgrades including roads (refer to **Section 3.1** and **Plan A03**) resulting in canopy gaps larger than 25 m to the north east and west.
- Some connectivity currently exists to the south however this area is currently under application for future residential development. Vegetation currently present in this area is mapped as young and young to intermediate by Griffith University therefore is unlikely to contain habitat for the yellow-bellied glider.

Habitat critical to the survival of the South-eastern Yellow-bellied Glider is defined by '*large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing*'. As described above, the referral area is highly fragmented and does not contain key habitat features for this species.



The species requires floristically diverse eucalypt forest, field surveys identified vegetation within the referral area as a single assessment unit dominated by *Corymbia citriodora* (Spotted Gum). While other eucalypt species are present within the referral area, the dominance of a single species and single vegetation community does not provide the floristically diverse species required to support this species. Furthermore, the small referral area which is highly isolated further limits the availability of foraging resources.

The referral area was surveyed utilising targeted nocturnal searches. Given the limited size of the referral, the lack of recorded individuals indicates high confidence that the referral is not currently utilised by the species. Furthermore, no evidence of the distinctive 'V' shaped incisions were observed on site.

Significant Impact Assessment

As part of the original referral material, the South-eastern Yellow-bellied Glider was considered as having a low likelihood of occurrence and therefore a significant impact assessment as not warranted. The PD RFI requests further assessment of the South-eastern Yellow-bellied Glider and therefore a significant impact assessment has been completed and provided as **Table A33**. Further justification has been provided within this documentation with reference to the conservation advice for the species. Detailed assessment does not identify the referral area as containing habitat critical to the survival of the species. The species was not observed within the referral area nor are there any records within the locality. With respect to likelihood that the referral area will provide habitat for the species into the future, the referral area and surrounds are earmarked for future development (refer **Plan A3**) and it is noteworthy that the site is significantly fragmented by existing and approved development, including EPBC Act approved residential development sites. The RVPDA intends for the site and surrounds to be developed for urban uses (**Plan A3**). A significant impact assessment has been provided in **Table A33**.



Table A36: Significant impact assessment – South-eastern Yellow-bellied Glider (Vulnerable)

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population	The referral area is not considered to provide habitat critical to the survival of the species based on several key attributes. The referral area does not contain a large contiguous area as roads and current/future developments have resulted in a highly isolated, small patch of vegetation. The referral area lacks floristically diverse eucalypt forest as only a single highly isolated vegetation community is present within a small area. The referral area lacks living hollow bearing trees due to historical logging and modification. Of the 9 hollow bearing trees observed on-site seven (7) are dead trees. The species was not observed on-site and no evidence of the distinctive 'V' shaped incisions were recorded. Additionally, there are no records of the species within the locality. Large areas of contiguous, diverse, old growth vegetation is present further south and east associated within White Rock Conservation Area/Flinders Karawatha Corridor. The vegetation on-site does not provide habitat for the species now or in the future given the zoning intent of the region. Therefore, the proposed action is unlikely to lead to a long-term decrease in the size of an important population.	**Significant impact not likely**
Reduce the area of occupancy of an important population of the species	The referral area does not contain suitable habitat for the species as it lacks large contiguous habitat, diverse eucalypt forest, and living hollow bearing trees. Furthermore, no evidence of the species has been observed on, or adjacent to, the site historically or during recent surveys. Most of the records present are approximately 15-20km east of the site (refer **Plan A13**). The context of the site within RVPDA, surrounded by existing developments and roads limits the likelihood the species would utilise the site even as a transient individual. The isolation of the site is only expected to become more significant following the expected completion of several development applications in the region. Therefore, the proposed action is not considered to reduce the area of occupancy of an important population of the species.	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
Fragment an existing important population into two or more populations	There is no evidence that an important population exists within the referral area based on recent historical records. Furthermore, it is unlikely that the species would utilise the referral area given the lack of necessary habitat features and highly isolated nature of the site. The site is not strategically located to provide any landscape or local level connectivity, as such the removal of vegetation on-site is not considered to have any impact on the species. All records of the species are located within large contiguous areas of old growth forest with a diverse mix of species (refer **Plan A13**). These areas are protected and enhanced by the zoning intent of the RVPDA. Therefore, it is highly unlikely the proposed development will result in the fragmentation of an existing important population into two or more populations.	**Significant impact not likely**
Adversely affect habitat critical to the survival of a species	The *Conservation Advice for Petaurus australis australis (South-eastern Yellow-bellied Glider (south-eastern))* defines habitat critical to the survival of the species as areas: - large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees - areas identified as refuges under future climate change scenarios; - short or long-term post-fire refuges (i.e., unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas; - habitat corridors required to facilitate dispersal of the subspecies between fragmented habitat patches and/or that enable recolonization or movement away from threats. - areas in which some trees have evidence of use for sap extraction by South-eastern Yellow-bellied Glider (south-eastern). As discussed previously, the referral area lacks features of critical habitat to support the species given historical modification, highly isolated, small, vegetated area and lack of records on or adjacent to the site. As the site doe does not contain vegetation that is considers habitat critical to the survival of the species, the proposed development is not adversely affecting habitat critical to the survival of the species. Given the locations of the site	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
	adjacent to roads and existing/future developments, the proposed vegetation clearing will no indirectly impact habitat critical to the survival of the species.	
Disrupt the breeding cycle of an important population	The referral area does not contain suitable breeding habitat for the species which is considered as live mature hollow bearing trees. All hollowing bearing trees were recorded within the referral area resulting in only nine (9) hollow bearing trees present (refer **Plan A15**). Notably seven (7) of those trees are dead trees which are not preferred by the species. There is no evidence that an important population is utilising the referral area as no direct or indirect evidence was recorded and there are no records within the locality of the site. Furthermore, the site is highly isolated with adjacent areas largely cleared to facilitate urban uses. It is therefore highly unlikely that the species would utilise the site at present or in the future. Given the lack of suitable habitat to support the species and highly isolated vegetation, it is considered highly unlikely that the project will disrupt the breeding cycle of an important population.	**Significant impact not likely**
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The referral area contains only 7.52ha of vegetation which is highly isolated by roads and existing/future urban developments. Key habitat requirements are limited within the referral area which subsequently do not contribute to the landscape levels value for the species. The species is highly unlikely to utilise the referral area at present, which is only going to become more restrictive following the expected completion of several surrounding developments. Vegetation that is known to contribute to the survival of the species is associated with White Rock Conservation Park and Flinders Karawatha Corridor to the south and south/east. These areas contain a diverse mix of vegetation communities within a large contiguous area of mature vegetation. Furthermore, these areas are reflected in the zoning of RVPDA as 'environmental protection' and such are protected/enhanced by future developments. The development of the referral area will not modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**Significant impact not likely**

Significant Impact Criteria	Assessment	Impact
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Predation by European red foxes (Vulpes vulpes) and feral cats (Felis catus) are listed as threats to the species. The referral area is located within an area rapidly transitions from rural to urban. At present, feral animals including European red foxes (Vulpes vulpes) and feral cats (Felis catus) are present. It is unlikely the proposed development would introduce invasive species that are not present within the area	**Significant impact not likely**
Introduce disease that may cause the species to decline	It is highly unlikely the proposed development would introduce disease that would harm the South-eastern Yellow-bellied Glider. This is particularly so as the referral area currently lacks any suitable habitat and therefore is unlikely to attract any South-eastern Yellow-bellied Glider to the area where disease could spread.	**Significant impact not likely**
Interfere substantially with the recovery of the species	Several conservation and management priorities have been identified in the South-eastern Yellow-bellied Glider Conservation Advice. These management priorities generally revolve around preventing burns and timber harvesting protecting large old trees and maintaining connectivity between regions. As discussed in the above points, detailed field surveys did not identify suitable habitat for the species nor was any evidence of the species utilising the referral area observed. There are no records in the locality of the site with all records located within large contiguous areas of mature vegetation further south and south-east. Additionally, the site is not located in a way that promotes connectivity potential for the species at present or in the future given the abundance of housing development and roads. It is therefore considered highly unlikely that the project will interfere substantially with the recovery of the species as it is considered unlikely the referral area in it's current state could support the species in any capacity.	**Significant impact not likely**

4.8. Indirect impacts

Item 4.2 of the PD Request states, ***'To inform point 4.1, please provide an assessment of the direct, indirect, facilitated and cumulative impacts that may occur as a result of the proposed action at a local and regional scale.***

The preliminary documentation must, at minimum, identify and provide a detailed assessment of indirect or facilitated impacts that may result from the proposed action, including but not limited to the following:

- ***Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment.***
- ***Vehicle movement – potential increase of vehicles to strike fauna in the pre-construction, construction, and operation phase of the project.***
- ***Increased presence of dogs – pre-construction, construction and operation phases have the potential to increase dog presence in the referral area and adjacent environment.***
- ***Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil in the pre-construction and construction phase of the project.***
- ***Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during construction and operation of the residential development'***

A detailed description of potential indirect impacts and an analysis of their potential impacts to Koala and Grey-headed Flying-fox are detailed within **Table A37**.

Table A37: Indirect impact analysis

Indirect impact	Koala	Grey-headed Flying-fox
Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment.	The proposed development is highly unlikely to increase the prevalence of weeds on site given no vegetation is proposed for retention. Furthermore, the site is surrounded on all sides by roads and residential developments. It is unlikely that the development would increase weed presence from current levels on or adjacent to the site. Further, the proposed development is not considered likely to introduce pathogens that would negatively impact any Koalas that should be utilising this area.	The proposed development is highly unlikely to increase the prevalence of weeds on site given no vegetation is proposed for retention. Furthermore, the site is surrounded on all sides by roads and residential developments. It is unlikely that the development would increase weed presence from current levels on or adjacent to the site. Further, the proposed development is not considered likely to introduce pathogens that would negatively impact any Grey-headed Flying-fox that should be utilising this area.
Increased vehicle strike from increased frequency of vehicle movements throughout construction and operation of the residential development and associated infrastructure.	Upon completion of the development, vehicle traffic will increase compared to baseline conditions, increasing the likelihood of vehicle strike of Koalas should any happen to utilise the broader area. The probability of fauna strike is reduced due to the fact that most fauna will generally avoid urban areas. Furthermore, the threat of vehicle strike is already present in the area as existing roads and residential developments are present adjacent to the site. No vegetation retention is proposed with the site and therefore the project will not encourage Koala into the area. Speed limits within the site and adjacent roads will be generally limited to 50 km/hr. Vehicle traffic associated with the construction and earthworks phase of the development will also increase. Measures will be implemented to reduce vehicle speeds across the site which will be limited to 20 km/hr during construction.	GHFF are not considered to be at increased risk of vehicular strike as they are not a ground-dwelling species.
Increased presence of dogs – pre-construction, construction and operation phases have the potential to increase dog	Dogs will not be allowed on-site during the construction phase of the project. During the operation phase of the project the number of domestic dogs in the local will increase through ownership. The development does not propose and retention areas of parks. Dogs	GHFF are not considered to be at increased risk of dog as they are not a ground-dwelling species.

Indirect impact	Koala	Grey-headed Flying-fox
presence in the referral area and adjacent environment.	will be required to be on-leash within the residential area and therefore the risk of dog attack on Koala is low despite the increase in dog numbers. Furthermore, the site is currently highly isolated from surrounding vegetation.	
Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil in the pre-construction and construction phase of the project. ***Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during construction and operation of the residential development***	<u>Noise</u> Noise levels greater than existing ambient noise levels are expected during construction within the site which will be present for the duration of the project (approximately 1 year). Sources of noise are likely to consist of noise in short, intense pulses from mobile plant equipment, and more prolonged noise, with consistent vibration, pitch and volume from generators, excavators and pumps, in addition to noise from vehicles. Both steady continuous and single noise events have the potential to lead to ecological impacts. Construction noise is expected to elicit some avoidance response from fauna including the Koala, should any be using the surrounding vegetation. However, with consideration of the extent of habitat available within the site and the presence of existing roads and residential developments on all sides of the site in this is likely to be a negligible to minor impact. Additionally, noise levels are likely to increase once the development is complete as there will be increased vehicular and pedestrian traffic. Road noise will be the primary source of noise impact. The establishment and use of garden paths through landscaped areas will also provide a source of noise due to pedestrian traffic. However, the impact of this to any Koalas in the surrounding area is considered to be minor given the existing isolation of the site and presence of rods and residential developments. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g.	<u>Noise</u> Noise levels greater than existing ambient noise levels are expected during construction within the site which will be present for the duration of the project (approximately 1 year). Sources of noise are likely to consist of noise in short, intense pulses from mobile plant equipment, and more prolonged noise, with consistent vibration, pitch and volume from generators, excavators and pumps, in addition to noise from vehicles. Both steady continuous and single noise events have the potential to lead to ecological impacts. Construction noise is expected to elicit some avoidance response from fauna including the GHFF, should any be using the surrounding vegetation. However, with consideration of the extent of habitat available within the site and the presence of existing roads and residential developments on all sides of the site in this is likely to be a negligible to minor impact. Additionally, noise levels are likely to increase once the development is complete as there will be increased vehicular and pedestrian traffic. Road noise will be the primary source of noise impact. The establishment and use of garden paths through landscaped areas will also provide a source of noise due to pedestrian traffic. However, as the GHFF is a highly mobile species and the closest known roost is 2.5km north-east of the site (Yamanto (479)) the impact of this to any GHFF in the surrounding area is considered to be minor. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g.

Indirect impact	Koala	Grey-headed Flying-fox
	wavelength, colour), intensity and duration potentially evoking different faunal responses. Impacts from increased light levels include disorientation from, or attraction toward, artificial sources of light; mortality from collisions with structures; and effects on light-sensitive cycles of species (e.g. breeding and migration for fauna and flowering in plants). An artificial increase in lighting can also affect abundance of predators. Presence and intensity of artificial light in the site will temporarily increase during the construction phase; however, night works will not be permitted. Lighting will be directed to construction areas within the site. Some light spillage will be inevitable and is likely to be contained. Potential impacts associated with light emissions will be temporary and unlikely to be significant given the presence of existing roads and streetlights adjacent to the site. With implementation of standard mitigation measures details above, the project is likely to result in a negligible impact to any Koalas in the surrounding area due to the use of light pollution during construction. The operational phase of the project will increase the levels of ambient light to the region; however, lighting associated with adjoining residential developments and roads is already present. Furthermore, no areas of vegetation retention are proposed within the site or immediate adjacent and therefore potential indirect impacts associated with the project are unlikely. <u>Dust and Sediment Generation</u> Construction activities have the potential to generate dust emissions. Dust emissions during construction will be temporary. The main sources of dust will be generated via: • wheel-generated dust from the haul roads created for the construction phase;	wavelength, colour), intensity and duration potentially evoking different faunal responses. Impacts from increased light levels include disorientation from, or attraction toward, artificial sources of light; mortality from collisions with structures; and effects on light-sensitive cycles of species (e.g. breeding and migration for fauna and flowering in plants). An artificial increase in lighting can also affect abundance of predators. Presence and intensity of artificial light in the site will temporarily increase during the construction phase; however, night works will not be permitted. Lighting will be directed to construction areas within the site. Some light spillage will be inevitable and is likely to be contained. Potential impacts associated with light emissions will be temporary and unlikely to be significant given the presence of existing roads and streetlights adjacent to the site. With implementation of standard mitigation measures details above, the project is likely to result in a negligible impact to any GHFF in the surrounding area due to the use of light pollution during construction. The operational phase of the project will increase the levels of ambient light to the region; however, lighting associated with adjoining residential developments and roads is already present. Furthermore, no areas of vegetation retention are proposed within the site or immediate adjacent and therefore potential indirect impacts associated with the project are unlikely. <u>Dust and Sediment Generation</u> Construction activities have the potential to generate dust emissions. Dust emissions during construction will be temporary. The main sources of dust will be generated via: • wheel-generated dust from the haul roads created for the construction phase;

Indirect impact	Koala	Grey-headed Flying-fox
	• dust lift-off from exposed surfaces (e.g. construction roads and pads); • earthworks, including construction of the embankments, and moving, dumping and shaping material; and • vegetation and soil clearing of the land. Excessive deposition of dust on leaves of plants can suppress the growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality for fauna. With implementation of standard mitigation measures including and erosion and sediment control plan, will be implemented by the civil contractors during construction. Furthermore, no areas of vegetation retention are proposed within the site and no vegetation is immediate adjacent to the site. The project is likely to result in a negligible impact to any Koalas utilising the local area due to the generation of dust.	• dust lift-off from exposed surfaces (e.g. construction roads and pads); • earthworks, including construction of the embankments, and moving, dumping and shaping material; and • vegetation and soil clearing of the land. Excessive deposition of dust on leaves of plants can suppress the growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality for fauna. With implementation of standard mitigation measures including and erosion and sediment control plan, will be implemented by the civil contractors during construction. Furthermore, no areas of vegetation retention are proposed within the site and no vegetation is immediate adjacent to the site. The project is likely to result in a negligible impact to any GHFF utilising the local area due to the generation of dust.
Ongoing residential use – potential for fauna to become trapped in the completed residential areas increasing stress and risk of impact from vehicle strike and domestic animals	Once development is completed the site will be a residential community with low and medium density housing including a series of internal access roads. Due to the small size of the site and high level of urbanisation in the surrounding landscape (urban development exists in adjacent properties to the north, east and west with the property to the south currently under application), no conservation or open space areas will be retained within the development footprint that may contain food trees for the koala. Food trees will also not be included in landscaping of the development footprint so that koalas and are not enticed to enter the residential area. Given the lack of vegetated areas or food trees that may entice koalas within the development footprint and urbanisation of the	GHFF are not considered to be at increased risk from being trapped by ongoing residential uses as they are not a ground-dwelling species.

Indirect impact	Koala	Grey-headed Flying-fox
	surrounding area, it is considered highly unlikely that koalas will frequent the future urban area. Even though the risk of koalas entering the residential area is minimal, a range of management measures will be implemented in order to reduce the potential injury or mortality to any individuals that may stray into the development and become trapped. This includes: • Low vehicle speeds to reduce the risk of collisions. Vehicle speed limits are restricted to 50km/h on built up residential roads. • Installation of traffic calming devices (where required). • Installation of koala awareness signage to raise awareness of the species' presence in the area.	

5. Avoidance and Mitigation

This section responds to Item 5 of the PD request which requests further details on proposed mitigation and rehabilitation measures, including the following subsections.

5.1. Description of impact avoidance

Item 5.1 of the PD Request asks for ***"Demonstrate that you have applied the mitigation hierarchy and exhausted all options to avoid and mitigate harm to protected matters, before resorting to environmental offsets."***

The project has been assessed extensively against the avoidance and mitigation hierarchy. The following sections provide details on why avoidance is not appropriate for this project and the various mitigation measures that are proposed to minimise the risk of impact on MNES.

5.1.1 Avoidance

From a strategic planning perspective, the referral area is centrally located within RVPDA, a significant growth area in the rapidly developing western extent of South-east Queensland. The referral area is zoned 100% as 'urban living' under the RVPDA development scheme with all land immediately adjacent to the project also zoned as 'urban living', reflecting the planning intent of the region. As such, the development of surrounding lots to the west, north and east has either commenced or been complete and several development applications are currently active south of Binnies Road (refer **Plan A3**). Further, the referral area is surrounded by roads including Tempo Road to the east, Daleys Road to the west and Binnies Road to the south, the latter of which has been conditioned for upgrade as part of the adjacent developments.

The proposed and existing development over the majority of land holdings surrounding the referral area reflects the planning intent of the RVPDA, specifically the zoning of 'urban living.' The purpose of the RPVDA zoning was to concentrate areas proposed for urban developments while providing landscape level connectivity and functionality of high ecological value areas (remnant vegetation, waterways, etc) zoned as Environmental protection. The referral area is approximately 2.5km form the nearest environmental protection zoning, undoubtedly indicating the overarching intended use of the referral area and surrounds as an urban development and not as an area to provide connectivity or fauna refuge. The planning of the RVPDA provides a balance between residential and environmental land uses and attempts to concentrate development to areas of intended urbanisation whilst retaining a network of fauna movement and refuge.

As the surrounding region continues to urbanise due to significant population growth, retaining vegetation would become redundant within the local landscape within the referral area would offer no connectivity value. In addition, the referral area is not large enough to provide suitable habitat as a stand-alone conservation, area even if retained in its entirety. Retaining a small amount of vegetation would not provide the necessary resource to support any threatened species and would put fauna at risk of vehicle strike or dog attach due to the lack of connectivity surrounding the site.

5.1.2 Vegetation values

While the referral area is vegetated and predominantly mapped as remnant vegetation, historical selective logging has reduced the availability of large mature tree specimens and hollow-bearing trees. These habitat features are necessary to support a number of threatened species, as discussed in **Section 4**. Furthermore, the site contains a single vegetation community which is nominated as *Least Concern* under the Queensland VMA and is abundant in the local area.

No diversity in habitat types, i.e. riparian vegetation or rocky areas, are present within the referral area, thus further limiting the ability of the site to provide habitat for specialist or threatened species. Further, the referral area small overall size means that it has a high area to boundary ratio. Therefore, the majority of vegetation within the referral area is in close proximity to existing and/or future urban development, ultimately reducing the suitability of the site to species that are highly sensitive to disturbance and human presence. Thin linear strips of vegetation do not provide functional corridors, particularly for species such as Koala where a minimum 100 m corridor is advised to continue to support this species (DES, 2022). Research shows that large, wide, and intact areas of vegetation are far more likely to provide suitable habitat and movement opportunities for a range of species (Catterall et al. 1993).

5.2. Description of mitigation measures

Item 5.2 of the PD Request asks for ***"Provide details (including a summary list or table) of avoidance and mitigation measures proposed to be undertaken to prevent or minimise impacts on protected matters (or their habitat) from the proposed action area, including:"***

a) a description of avoidance measures that have been considered and applied. For example, proposed project site selection to avoid valuable habitat, micro-siting of infrastructure to avoid impacts on habitat on site, or avoidance of any activity that may indirectly impact on essential lifecycle processes for species.

b) a description of proposed safeguards and mitigation measures to minimise and manage relevant impacts of the action, with reference to relevant statutory or policy documents at the Commonwealth and State level (e.g., Guideline: State Development Assessment Provisions (State Code 25)).

c) pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.

d) measures to address the risk of species, such as the Koala, entering the residential area and becoming trapped/isolated without resources for shelter whilst in the residential area and safe movement opportunities to get out of the residential area, along with sufficient information on the location and design of these measures.

e) ongoing management of direct and indirect impacts due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by negotiating various fence types.

f) details of how speed reduction is to be achieved (e.g., traffic calming devices) and plans showing the locations of each of these features and the manner in which they will be implemented).

g) information on safe road design and placement, including installation of crossing warning signs, wildlife threshold marking on road (include maps and imagery).

h) the locations and size of any proposed fauna movement solutions, fire breaks, no-go or buffer zones (including buffers between the construction footprint or remaining habitat in the referral area and adjacent to the site), and potential fencing, including:

i. the location of any movement solutions, fire breaks, buffer zones, or fencing.

ii. the characteristics of the fauna movement solutions, fire breaks, buffer zones and fencing, (i.e., height, length, wildlife proof measures etc)

iii. whether the proposed measures, such as fencing will provide a wildlife barrier to/from/within the proposed project site.

i) description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes.

j) information on the timing, frequency, and duration of the measures to be implemented.

k) an actual or estimated cost of the mitigation measures."

As stated previously, avoidance measures are not proposed for the project, however several mitigation measures are proposed to ensure impacts are avoided and or minimised through the construction and operational phases.

5.2.1 Site Based Management Plan (Environment)

To avoid and mitigate the direct and indirect impact from the proposed action on the Koala, a project specific Site Based Management Plan (Environment) (SBMP) will be prepared and signed off by the Environmental Coordinator prior to the commencement of operational works. The SBMP will act as the Environmental Management Plan for the project.

Key outcomes within the SBMP for Koala include:

- Potential risks to the species (e.g. vehicle strike, entanglement, fragmentation of habitat / becoming stranded, noise/light pollution etc.) are identified and appropriately managed.
- All persons involved in construction and operation of the development are aware of the site values, their potential to impact on the above species and their habitats, and their responsibilities in regard to procedures and strategies with the SBMP.

The SBMP will outline construction measures to manage and mitigate impacts on native flora, and fauna, specifically the Koala and will include details on:

- Project Description
- Environmental Management, including:
    - SBMP objectives;

  - Identification of key personnel;
  - Roles and Responsibilities;
  - Environmental awareness and compliance training for all contractors and sub-contractors;
  - Adaptive management; and
  - Statutory requirements.
- Pre-Clearance Requirements – Fauna Management, including:
  - Vegetation management (clearing and protection), including:
    - Objectives;
    - Management Strategy;
    - Performance Indicators;
    - Environmental Outcomes; and
    - Monitoring and Adaptive Management.
  - Protection of MNES Fauna (Koala) and Native Wildlife, including:
    - Objectives;
    - Management Strategy;
    - Performance Indicators;
    - Environmental Outcomes;
    - Monitoring and Adaptive Management;
    - Requirements of the DES approved Fauna Spotter/Catcher and adoption of the *Code of Practice for the Welfare of Animals Affected by Land Clearing and Other Habitat Impacts* in pre-clearance surveys, reporting and monitoring
    - Sequential clearing plan and clearing restrictions; and
    - Specifications and requirements for temporary fauna exclusion fencing.
- Maintenance of Safe Wildlife Movement Opportunities (during Construction) including:
    - Objectives;
    - Management Strategy;
    - Performance Indicators;
    - Environmental Outcomes;
    - Details of Temporary fencing;
    - Hours of Operation,
    - Details of Fauna awareness signage; and
    - Details of Vehicle movement controls.

5.2.2 Description of pre-clearance and clearance procedures

Item 45.3(c) of the PD Request specifically asks for, *pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.*

Environmental Pre-clearance Package

Prior to vegetation clearing within the referral area, an Environmental Pre-clearance Checklist and Environmental Pre-clearance Package will be created and issued to the project team, including all relevant contractors and sub-contractors, to ensure all approval requirements are met. Environmental Pre-clearance Checklists are designed to easily show compliance for approval requirements, including EPBC approval requirements, in a format where they can be reviewed and 'ticked off' prior to vegetation clearing. The purpose of the checklist is to ensure the following can occur:

- All required approvals are in place prior to clearing and all relevant documentation, including approvals, approved plans and management documents are compiled and distributed to all relevant personnel.
- Threatened flora and fauna pre-clearance checks are undertaken of the clearing extent and appropriately documented so that:
    - any threatened flora in the cleared area is identified and appropriate measures are in place; and
    - any threatened fauna and / or fauna habitat is identified and appropriately managed.
- Appropriate induction procedures are in place and environmental requirements are understood and complied with by all contractors and sub-contractors.

The Environmental Pre-clearance Checklist is to be read in conjunction with the SBMP. Together the Environmental Pre-clearance Checklist and subsequent attachments, and the SBMP will form the Environmental Pre-clearance Package for that scope of works. Environmental Pre-clearance Packages require all approval documentation, including EPBC Act approval requirements relevant to clearing, to be prepared, compiled and distributed to all relevant parties prior to the commencement of clearing. The Environmental Coordinator for the project will be responsible for the preparation of and the distribution of the Environmental Pre-clearance Package.

All relevant parties (e.g. civil contractor, clearing contractor, fauna spotter / catcher, environmental coordinator, superintendent and Client) must sign the checklist prior to clearing, acknowledging that they have reviewed all, and will undertake the works in accordance with approved procedures and reporting. As way of acknowledgement, the Environmental Pre-clearance Checklist will be run through at a project pre-start meeting with all personnel and relevant parties required to sign the checklist. No clearing can commence for a specific phase of works until the checklist has been completed and signed off by the Environmental Coordinator.

Fauna Friendly Tree Protection Fencing

Clearing and construction works associated with the development impacts will be limited to a maximum of 7.52 ha. Prior to clearing, temporary fauna friendly tree protection fencing in the form of orange bunting



and temporary signage will be installed around the clearing impact area. The presence of tree protection fencing will ensure that no authorised clearing impacts occur outside of the clearing footprint and to allow any fauna present within the clearing footprint to disperse retained habitat areas.

Fauna Spotter Catcher Roles and Reporting

As required by the SBMP, a Department of Environment, Science, and Innovation (DESI) registered Fauna Spotter Catcher must be appointed to ensure fauna, specifically Koala, management occurs prior to, during and post clearing. This role is mandated for any clearing of native vegetation in Queensland. The role of the Fauna Spotter Catcher is to complete an assessment of the works area no more than 2 weeks prior to clearing and present a short report to the proponent on the findings and how the proposed clearing is to be managed. The Fauna Spotter Catcher is required at the pre-start meeting and to be on site during all times of clearing works.

Under the *Nature Conservation Act 1992*, registered Fauna Spotter Catchers must complete a return of operations report to the Queensland State Government stating all fauna encountered and the specific management measures used to ensure the safety of native animals.

It is the role of the Fauna Spotter Catcher to take all reasonable steps to protect wildlife that may be impacted by vegetation clearing. These steps include the following:

- Undertaking wildlife load reduction measures through the pre-clearing trapping and relocation of wildlife within 1 to 2 weeks prior to the approved clearing being conducted. Sequential clearing cannot be used as a primary fauna management measure.
- Clearly distinguish vegetation found to contain fauna or fauna habitat (e.g. tree hollows, arboreal termite mounds, stick nests or possum drays) with flagging tape, and visually and verbally communicate this information to the tree feller to ensure flagged trees are not felled until authorised by the fauna manager.
- Manage any Koalas identified on site in accordance with the *Nature Conservation (Koala) Conservation Plan 2017* and *Management Program 2006-2016*.
- Manage fauna habitat identified during the site inspection using the protocols discussed in the SBMP.
- Work in conjunction with a professional tree feller in the removal of any vegetation.
- Schedule vegetation clearing to ensure that the impacts on wildlife are minimised and the likelihood of detection and capture of wildlife is maximised and wildlife load reduction measures are productive.
- Ensuring vegetation and rubbish piles are not left to serve as refuge for displaced or roaming wildlife through the implementation of the following measures:
    - Immediately (within 12 hours) remove or destroy such material.
    - Erect wildlife proof barriers, such as fencing surrounding stockpiles to prevent wildlife use.
    - Ensure old (>12 hours) piles of felled vegetation are treated as potential wildlife habitat and inspected by a wildlife spotter/catcher prior to removal or destruction.

- Limiting the felling of habitat and hollow bearing trees to the following methods:
    - Segmental removal of tree, with hollow bearing limbs being checked by the Fauna Spotter Catcher and cleared of fauna using a cherry picker or suitable means determined by the Fauna Spotter Catcher.
    - Segmental removal of the tree, with hollow bearing limbs plugged and lowered to the ground for inspection by wildlife spotter.
    - Use of an excavator with vertical grab to lower the main trunk (only after the removal of lateral limbs).
    - A combination of the above methods.

Adoption of the RSPCA / ESU of WW Draft Code for Fauna Spotting

The project will adopt the *DRAFT Code of Practice for the welfare of animals affected by land-clearing and other habitat impacts* (Draft Code) prepared by the *Australia Zoo Wildlife Warriors* and *Voiceless* organisations. The Draft Code is not mandatory, however, is advocated by various environmental organisations as the leading practice method for minimising impacts of native wildlife during construction processes.

The Draft Code will be adopted to ensure that fair, reasonable and appropriate measures are undertaken to minimise the adverse impacts on wildlife as a result of vegetation clearing. The Draft Code provides standards and guidelines for the humane treatment of wild animals affected by land clearing by detailing the general responsibilities of people involved in land clearing and the specific roles of wildlife spotter/catchers. As emphasised within the Draft Code, it will be the responsibility of all relevant parties to:

- take all reasonable steps necessary to prevent cruelty or suffering to animals;
- minimise the loss of wildlife caused directly or indirectly by development or land clearing; and
- conserve, to the greatest extent possible, the ecological values of the development site and their surrounding natural environment (Draft Code, p.5).

The following components of the Draft Code are to be adopted as the following actions for any clearing works:

Action 1 – Developer to Engage Fauna Spotter Catcher

This action requires that the developer engage a Fauna Spotter Catcher with full registrations and licences provided in accordance with DESI.

Action 2 – Fauna Spotter to Prepare a Wildlife Protection and Management Plan (WPMP)

The WPMP should include the following information:

- description of the project with reference to impacts on wildlife or wildlife habitat;
- pre-development plan of the site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- results of any fauna surveys including pre-clearance surveys; and

- a wildlife and habitat impact assessment based on the proposed development works.

Action 3 – Prepare a Wildlife and Habitat Impact Mitigation Plan (WHIMP)

Following completion and of the WPMP the Fauna Spotter Catcher should prepare a more specific WHIMP, which will include details on:

- measures required to be completed to minimise wildlife and habitat impacts during operational works;
- wildlife capture and removal plan;
- contingency plan for wildlife requiring euthanasia, other veterinary procedures or captive care;
- wildlife storage and housing plan;
- wildlife release and disposal plan; and
- post works measures to minimise impacts on wildlife.

Action 4 – Fauna Spotter Catcher Role at Pre-Start Meeting

Prior to the commencement of any construction works, a pre-start meeting is to be held between the project manager, site foreperson, plant operators and Local Government representatives. At the pre-start meeting, the Fauna Spotter Catcher is to outline the clearing process and the requirements listed in the SBMP.

Action 5 – During Construction

The Fauna Spotter Catcher is to be on site during all phases of construction which involve potential impacts on wildlife or habitat. This will enable to the Fauna Spotter Catcher to make any necessary adjustments to cater for any specific issues encountered during the clearing works.

Action 6 – Post Works Reporting (Wildlife Management Report)

During the course of all site works, including the pre-clearance surveys, the Fauna Spotter Catcher is to keep an accurate record of all animals encountered, captured, incidents and disposals for each stage of the project. The records should form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report should consist of the following 3 sections:

1. *Wildlife Habitat Management Plan* – Aspects of the planning, design, construction and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, frequency and timeframes for monitoring.
2. *Wildlife Capture and Disposal Plan* – Should contain the following details for each captured animal:
    a. Species.
    b. Identification name or number.
    c. Sex (M, F or unknown).
    d. Approximate Age or Age Class (neonate, juvenile, sub-adult, adult).
    e. Time and date of capture.

f. Method of capture.

g. Exact point of capture (GPS coordinates).

h. State of health.

i. Incidents associated with capture likely to affect health.

j. Veterinary intervention or treatments.

k. Time held in captivity.

l. Disposal method (euthanasia, translocation, re-release).

m. Date and time of disposal.

n. Detailed of disposal (GPS points of release).

o. For released animals, location relative to point of capture.

3. Animal Injury and Euthanasia Report – similar details for the Wildlife Capture and Disposal Plan should be included in this report.

Vegetation Clearing and Fauna Management Plan

A Vegetation Clearing and Fauna Management Plan (VCFMP) may be required which will manage and mitigate potential impacts of the construction phase.

The VCFMP will include details on:

- trees marked for removal;
- all civil works likely to impact existing vegetation;
- temporary and permanent exclusion and protection fencing;
- roles and responsibilities for site contractors, the developer and the consultant group;
- stockpiling and site access locations;
- links to weed management and revegetation proposals;
- species surveyed as using the site, focusing on those most likely impacted by development works;
- a list of relevant State and Commonwealth legislation constraints and controls for fauna potentially affected by development works;
- a plan showing existing habitat opportunities and locations;
- details of the threats to existing fauna species;
- a clearing sequence plan showing the commencement of clearing and direction of removal to allow for the appropriate flushing of fauna towards safe havens and/or the application of an appropriate relocation program;
- management and mitigation measures – i.e. temporary use of fauna exclusion fencing;
- description of fauna spotter role, contacts and certification; and

- specific fauna management procedures for potential or known habitat trees.

5.2.3 Koala Management Measures

The proposed development is not intending to retain any areas on site as ecological corridors due to the urban planning intent of the region. Even though the risk of koalas entering the residential area is minimal, the project will implement koala sensitive design features in accordance with the Koala Sensitive Design Guidelines (State of Queensland 2022). Management measures implemented will include:

- Low vehicle speeds to reduce the risk of collisions. Vehicle speed limits are restricted to 50km/h on built up residential roads.
- Installation of traffic calming devices (where required).
- Installation of koala awareness signage to raise awareness of the species' presence in the area.

The project will adopt the Draft Technical Note Wildlife Signage Guidelines development by the Department of Transport and Main Roads. The posted vehicle speed limit will be subject to ICC approval; however, it will not exceed 50 km/h and may be reduced at road crossing areas. Additionally, multiple Koala awareness signage types will be installed to promote fauna-sensitive driving behaviour and reduce the potential for vehicle strike.

5.2.4 Landscaping

Landscaping of the proposed development will utilise a mix of non-eucalypt trees and shrubs and ensure street and park trees, while being planted out with non-invasive native trees, don't specifically include any primary or secondary Koala food trees. Although considered a low likelihood given the future limited connectivity, the goal of this approach is to minimise the potential to attract Koalas to enter into the development area where vehicle strike and dog attack threats are heightened.

5.2.5 Education and awareness

An educational campaign to raise awareness of endemic fauna and domestic animals will be implemented by the proponent. The campaigns may include signage across public areas, social media communications, distribution of lifestyle guidelines on the purchase of a land parcel and letterbox drop pamphlets.

The distribution of "Lifestyle Guidelines" has the purpose of instilling stewardship amongst residents, encouraging them to actively protect native wildlife and providing awareness of the types of fauna that could disperse onto roads as well as how to appropriately manage domestic pets. Topics included within these education documents include:

- Appropriate plant selection on allotments.
- Inappropriate planting species (known local or declared weed species).
- Management of household scale run off.
- Protection of native animals and the types of native animals residents may expect to see.
- Understanding stormwater devices.

- Education on responsible domestic animal ownership within the referral area, including management of domestic animals, and providing key local and state phone numbers to contact if distressed fauna is located.
- Key local and state phone numbers to contact if distressed or orphaned fauna is located.

A copy of the lifestyle guidelines will be issued to new residents upon the purchase of an allotment within the development. Dog controls, off-leash areas and mitigation signage will likewise be enforced and maintained by Council under local regulations. The control of domestic animals across the referral area during the early operational phase will require assuming a reasonable level of personal responsibility from residents and the community, assisted by the provision of educational resources and signage provided by the proponent.

Community educational programs have demonstrated clear effectiveness in protecting koalas and other fauna through increased awareness, proactive conservation behaviours, and policy integration. For example, a two-year community engagement campaign carried out on the Redland Coast in Queensland — which included social marketing and citizen science— led to measurable conservation gains, such as increased reporting of koala sightings and increased participation in behaviour-change initiatives targeting threats like dog attacks (Fechner & Rundle-Thiele 2023). Another example is the Ballarat Koala Conservation and Education Program (2000–2009) which used the koala as a flagship species to engage local stakeholders, resulting in the incorporation of a Koala Plan of Management and habitat protections into regional planning schemes.

5.2.6 EPBC Annual Compliance Reporting

The proponent is required to complete an Annual Compliance Report for the period specified in the approval. The Annual Compliance Report ensures the proposed action is undertaken in accordance with the EPBC approval and is published on the project website.

5.2.7 Independent audits

Independent audits of the proposed action are usually undertaken at regular intervals (depending on approval conditions) or at the request of the Minister (or delegate). Independent audits help to ensure that projects with the potential to impact on MNES are implemented as planned. It is expected that the approval conditions will ensure regular independent audits of the proposed action are undertaken at the expense of the proponent.



5.3. Assessment of avoidance and mitigation measures

Item 5.4 of the PD Request asks, ***"For each measure proposed, indicate the:***

- ***a) impacts that are being avoided and/or the significance of impacts being reduced through mitigation.***
- ***b) Scientific basis for conclusions being drawn***
- ***c) an evidence-based likelihood of success/risk assessment***
- ***d) responsible party***
- ***e) milestones / performance / completion criteria***
- ***f) proposed monitoring and evaluation program."***

Discussion of the avoidance and mitigation measures, their individual performance and completion criteria, monitoring and reporting arrangements, residual risk and effectiveness are discussed in **Table A38** and **Table A39**.

5.3.1 Annual Compliance Reporting for the Impact Site

An annual compliance report (ACR) will be completed by the proponent with the first ACR to be published within 3 months of the 12-month anniversary of the commencement of the action. Compliance reports will be published every 12 months until the final lot is sold. A final compliance report will be issued within 3 months of construction of the final dwelling or infrastructure item within the referral area.

Table A38: Construction impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure	Responsible party	Risk Assessment	Milestone and timeline	Monitoring Actions	Corrective actions	Environmental outcomes
Loss of 7.38 hectares of critical habitat for the Koala and potential foraging habitat for the Grey-headed Flying -fox.	No more than 7.38 hectares of isolated vegetation identified as habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox, will be impacted to facilitate the development and is considered unavoidable.	Ecological surveys and habitat assessment conducted across the site (described in section 3.2) led to the precise spatial analysis of vegetation and habitat qualities. The project will result in the unavoidable loss of not more than 7.38 hectares of vegetation identified as habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox will be impacted to facilitate the development and is considered unavoidable.	Selection of a highly isolated site with significantly limited connectivity potential Clearing within referral area boundary	EDQ (QLD Government)- defined the 'urban living' zone and RVPDA establishment. Proponent – selected site based on zoning and context Environmental Consultant – Map values and complete ecological assessments Site contractor – flag clearing limits Environmental coordinator – check fauna friendly tree protection fencing alignment	Several detailed field surveys assessed the quality of habitat within the referral area and usage (described in section 3.2). The extremely isolated vegetation within the referral area does not provide significant linkages to allow Koalas to access the referral area. Field surveys identified low usage by the species. Furthermore, the small referral area does not constitute foraging habitat which an important population of highly mobile Grey-headed Flying-fox are likely to rely on. The development is located over the entire referral area which is considered low value habitat due to being highly isolated.	The referral area is cleared and developed. Works complete	Prior to commencement of vegetation clearing a VCFMP will be prepared that delineates the extent of clearing to ensure compliance with referral area boundary Environmental pre-start to check clearing limits and tree protection fencing EPBC Annual Compliance Report (ACR) which includes site audit confirming the proposed action is limited to referral area	Report any inconsistencies between the extent of works and referral area boundary to proponent and civil engineer. Correct limits Report non-compliance	Loss of critical habitat for the Koala and potential foraging habitat for GHFF. Habitat will be offset resulting in **no residual impact**
Risk of injury or mortality to Koalas and GHFF from vegetation clearing and construction	All clearing will be undertaken in accordance with the SBMP. This will include: • Provisions for the proponent to engage a qualified Fauna Spotter Catcher to participate in all vegetation clearing. The Fauna Spotter Catcher will be required to adopt elements of the Draft Code of Practice endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to ensure that no injury or deaths occur to Koalas or other fauna species. • Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Temporary fauna friendly fencing will allow fauna to safely disperse into vegetated areas away from construction, • Temporary fauna exclusion fencing will then be erected to prevent fauna dispersing into construction areas.	The use of a Fauna Spotter Catcher throughout clearing is an effective tool to: 1. Identify they types of species on site prior to clearing; and 2. Identify and flag habitat features that require thorough examination before clearing. Fauna Spotter Catchers have a primary role to ensure no fauna are in vegetation before it is cleared. Given the size of Koalas and their utilisation of tree branches, they can quite easily be observed from the ground. As such, it is extremely unlikely that a Koala will be killed or injured during vegetation clearing, particularly given the onerous and thorough procedures set out The Draft Code. The sequential clearing of vegetation will allow for the gradual loss of vegetation, giving fauna time to naturally disperse away from the disturbance. The use of fauna exclusion fencing around construction areas will ensure fauna do not disperse into unsafe, hostile areas, again minimising the risk of injury of death.	Fauna Spotter Sequential Clearing	Proponent – engage fauna spotter Fauna spotter – pre-clear inspection, WHIMP, WPMP, supervision of vegetation clearing and post clearing reporting Environmental Coordinator – review pre and post clearing reports Site Contractor – undertake clearing in accordance with VCFMP Fauna spotter – guides clearing direction to promote dispersal	Fauna Spotter present during clearing reduces risk of koala injury or mortality Sequential clearing allows Koalas to safely leave the area	No injury or death to Koalas during clearing. Mitigation measures applied at all times during clearing. Clearing completed as per sequential clearing	Pre-clear inspection. Environmental Coordinator to review pre-clear reports prior to pre-start meeting. On-site pre-start meeting with responsible parties. Supervision of all vegetation clearing works. Post clearing report – also reviewed by Environmental Coordinator. As above	In the event that a Koala is located within the impact area a 50m buffer and vegetated corridor is provided for dispersal to safe habitat As above	The use of a Fauna Spotter is mandated **No residual impact** Sequential clearing is mandated and guided by VCFMP and pre-clearance checklists and pre-starts **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure	Responsible party	Risk Assessment	Milestone and timeline	Monitoring Actions	Corrective actions	Environmental outcomes
	• Restricted construction hours (i.e. daylight 6am -6pm) • Prohibition of companion /security animals (e.g. dogs). • Restricted vehicle speeds (e.g. max 40km) within construction areas. In addition to this, all construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training all personnel will be instructed on their obligations in regard to vehicle movement and construction speed limits.	Each of these measures will ensure that the risk of injury or death to Koalas as a result of construction are avoided and mitigated. The aim of these procedures is to support **zero injuries or death to Koalas** as a result of construction.	Temporary fauna friendly fencing	Site contractor – flag extent of clearing with fauna friendly fencing Environmental coordinator – check fence for compliance	Temporary fencing allows Koalas to disperse out of the construction area	Temporary fauna friendly fencing utilised at all times during clearing	Pre-start meeting to check fence alignment and suitability for fauna dispersal EPBC ACR which includes audit confirming the proposed action is condition compliant	Fencing is rectified if deemed to be unsuitable prior to clearing	Temporary fauna fencing is mandated and guided by VCFMP and pre-clearance checklists and pre-starts. **No residual impact**
			Temporary fauna exclusion fencing	Proponent – engage fencing contractor Environmental Coordinator – confirm fencing type is compliant	Temporary fencing does not allow Koalas to re-enter the construction area	Temporary fencing utilised at all times during the clearing/construction process	As above	Fencing to be corrected if deemed not compliance by environmental coordinator	Temporary fauna fencing is mandated and guided by the SBMP. **No residual impact**
			Restricted construction hours	Site contractor – limits construction to 6am – 6pm	Work hours restricted so as to minimise impact to surrounding area	Works are completed within mandated hours at all times during clearing/construction	Site induction and daily sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent.	Works guided by SBMP. **No residual impact**
			Dog prohibitions	Site contractor – does not allows dogs	No companion and security dogs on site	Construction completed without dogs on site. At all times during clearing/construction	Site induction and daily sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent	Dog controls are mandated and guided by the SBMP. **No residual impact**
			Low vehicle speeds	Site contractor – applies speed limits during construction	Speed limits to reduce risk of Koala strike	Construction completed without vehicle strike	Site induction and daily sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent	Speed limits are mandated and guided by the SBMP. **No residual impact**
			Site inductions	Site contractor – all staff are inducted and daily toolbox talks	Induction/toolbox talks to raise awareness of potential Koala	Construction completed without inductions being breached	Site induction and daily sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent	Inductions are mandated and guided by the SBMP. **No residual impact**
Fragmentation of habitat for Koalas and GHFF, during construction	Vegetation on-site is highly isolated due to the location within an area designated for urban development. It is however acknowledged that vegetation clearing during the construction phase has the risk of fragmenting habitat areas within the site. To avoid this impact, vegetation clearing will be undertaken sequentially to allow fauna to disperse from construction areas to the south.	Habitat isolation and fragmentation is a primary concern due to its impacts on fauna. The direction of clearing of vegetation in accordance with the SBMP (informed by WHIMPs) will ensure that clearing does not create fragmented habitat islands that could trap fauna. Rather, procedures will be in place to ensure clearing flushes	Sequential clearing	Site Contractor – undertake clearing in accordance with VCFMP Fauna spotter – guides clearing direction to promote dispersal	Sequential clearing reduces risk of fragmentated habitat	Clearing completed as per sequential clearing plan Clearing completed without fauna mortality	Pre-clear inspection. Environmental Coordinator to review pre-clear reports prior to pre-start meeting. On-site pre-start meeting with responsible parties.	In the event that a Koala is located within the impact area a 50m buffer and vegetated corridor is provided for dispersal to safe habitat	Sequential clearing is mandated and guided by VCFMP and pre-clearance checklists and pre-starts **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure	Responsible party	Risk Assessment	Milestone and timeline	Monitoring Actions	Corrective actions	Environmental outcomes
	Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMPs and informed by the Fauna Spotter Cather WHIMPs. Clearing will be undertaken in a way that flushes fauna into connected areas of habitat and will avoid flushing fauna into fragmented or hostile areas. Specifically: • Fauna are not required to cross roads or move through developed or disturbed areas, such as residential areas of areas that require movement greater than 100m over cleared ground to reach suitable habitat; • Fauna are not left occupying an 'island' of habitat between hostile environments, such as road and cleared areas; • Fauna can safely leave the site of clearing and relocate to adjacent habitat; • Demarcation fencing will be fauna friendly to ensure fauna are not trapped within the proposed cleared extent; and • Cleared vegetation is to be stockpiled as to not impede fauna movement. Additionally, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas.	fauna away from construction areas into surrounding habitat areas that are connected to the wider landscape.					Supervision of all vegetation clearing works. Post clearing report – also reviewed by Environmental Coordinator.		
			<u>Temporary fauna friendly fencing</u>	Site contractor – flag extent of clearing with fauna friendly fencing Environmental coordinator – check fence for compliance	Koala area able to disperse from the construction area	T emporary fencing utilised at all times during construction	As above	Fauna friendly fencing is rectified in considered to be unsuitable during pre-start	Temporary fauna fencing is mandated and guided by the SBMP. **No residual impact**
			<u>Stockpiling of cleared vegetation ensures safe fauna movement</u>	Site contractor – ensure stockpiling is completed in accordance with SBMP	Stockpiling does not hinder Koala dispersal	Fauna are not fragmented by stockpiles	Site inductions and toolbox talks	Regular reporting by site contractor provided to Site Superintendent and proponent	Stockpiling is mandated and guided by the SBMP and VCFMP. **No residual impact**
Disturbance to Koalas and GHFF during construction	The SBMP will include controls to avoid, minimise and mitigate risk of disturbance to Koalas during construction, specifically: <u>Light and noise disturbance</u> Construction of the project will result in increased noise and light disturbance. These impacts may disturb fauna and disrupt foraging, reproduction or movement behaviours. Restricted construction hours (e.g. 6am-6pm) will limit disruption from light and noise impacts, as well as allow a 12 hour period for fauna to disperse and forage.	Construction management and clearing controls implemented by the SBMP are considered to be able to effectively avoid, minimise and mitigate risk of disturbance to Koala activities during construction, and allow for adaptive management where required. Limiting hours of construction and clearing to daylight hours, allows a 12 hour period for safe dispersal. With appropriate monitoring, pre, during and post construction by the Fauna Spotter Catcher, no residual impacts area expected to occur.	<u>CEMP and Restricted construction hours</u> <u>CEMP</u>	Site Contractor – limits construction to 6am-6pm. Proponent – ensure all procedures and protocols are followed on-site. Proponent – confirm acceptance of the CEMP and distribute to Site Superintendent and Contractors. Engineering Consultant – prepare CEMP detailing the procedures and performance criteria for each of the potential indirect impacts listed.	Minimising light and noise impacts	Light and noise disturbance is limited to daylight hours.	Site induction and daily Sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent.	Management measures implemented and guided by CEMP. **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure	Responsible party	Risk Assessment	Milestone and timeline	Monitoring Actions	Corrective actions	Environmental outcomes
	Contamination, weeds and pathogens Construction activities increase the risk of weeds, pathogens and contamination into the site. To manage these impacts, a Weed and Pathogen Management Plan will be prepared to identify potential weed species, and include appropriate controls for weed and pathogen management, disposal and monitoring. Weeds will be actively managed within the construction footprint and disposed of appropriately. No companion animals (e.g. dogs) will be allowed within construction areas.				The risk of contamination and exacerbating weeds and pathogens is minimised	Always during construction Contamination and weed and pathogen incursions do not occur	Site Superintendent required to undertake regular inspections and site audits to ensure the thresholds are not exceeded and/or performance criteria area achieved.	Undertake investigation into exceedance of thresholds and implement corrective actions as recommended in the CEMP.	**As above**
	Vehicle disturbance Reduced vehicle speeds will be implemented throughout the construction area to minimise vehicle disturbances. Further, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas.		Reduced vehicle speeds during construction	Site contractor – to enforce site speed limits during construction	Risk of Koala being impacted by high vehicle speeds during construction is reduced	Disturbance to Koala does not occur from vehicles	Site Superintendent required to undertake regular inspections and site audits to ensure the thresholds are not exceeded and/or performance criteria area achieved.	Regular reporting by site contractor provided to Site Superintendent and proponent.	Speed restrictions implemented by CEMP during construction. **No residual impact**
	Contractor management All construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vegetation clearing protocols and to protect native fauna.		Site induction and on-site daily toolbox talks	Site Contractor – prepare induction course and initiate daily toolbox talks prior to commencement of works. Construction personnel – complete site induction course, sign into site and attend daily toolbox talks. Proponent – ensure all procedures ad protocols are followed on-site.	Daily toolbox talks held with all construction personnel prior to the commencement of works for the day ensures all parties understand works extent, clearing limits and protocols, significantly reducing the likelihood of direct and indirect impacts to MNES values within and external the referral area.	Inductions and toolboxes completed at tall times during construction	Site induction and daily Sign in register.	Regular reporting by site contractor provided to Site Superintendent and proponent.	Site inductions mandatory **No residual impact**
Hydrological changes	Stormwater detention technologies will be utilised to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. All work will be undertaken in accordance with appropriate management plans to ensure the hydrological changes across the site do not impact on surrounding vegetation.	The implementation of a project wide Stormwater Management Plan as designed by certified engineers ensures that hydrological change area appropriately accounted for and managed. These management measures will reduce impacts from higher levels of surface water flow caused by hardstand areas and ensures natural drainage lines continue to function as they naturally would have. Stormwater detention basins prevent localised flooding of drainage lines and waterways caused by increased runoff over hardstand areas and also contribute to maintaining water quality levels.	Hydraulic and Stormwater Management Plan	Site engineer – complete management plans	Impacts associated with hydrological changes are minimised	No worsening of hydrological impacts as a result of the development	Monitoring requirements will be detailed in the associated management plans	Regular reporting by site contractor provided to Site Superintendent and proponent.	Erosion and sediment control plans mandatory **Non residual impact**

Table A39: Operational impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
Risk of injury or death to MNES from vehicle strike	A number of measures will be imposed to avoid and mitigate the risk of koalas being hit by vehicles. Although the risk to vehicle strike is low, these measures will be concurrent for grey-headed flying-fox. Measures include: • MNES food trees will not form part of the primary landscaping of the development footprint so that koalas and grey-headed flying-fox are not enticed to enter residential areas. • Imposition of low vehicle speeds to reduce the risk of collisions. Vehicle speed limits are restricted to 50km/h on built up residential roads. • Installation of traffic calming devices (where required). • Installation of koala awareness signage to raise awareness of the species' presence in the area.	The purpose of these avoidance and mitigation measures is to minimise the risk of injury or death to koalas from vehicle strike. These measures will also mitigate risks for grey-headed flying-fox. It will be important to minimise the incentive for these species to enter residential areas by restricting the availability of habitat in these areas. As such, street scaping will not be planted with suitable habitat, which will in turn encourage koalas to stay away from the development area. Importantly, low vehicle speeds will be imposed along residential roads, minimising the risk of high-speed vehicle strikes which were identified in the literature review as accounting for a large proportion of vehicle related deaths. In addition, awareness signage will 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 purpose of these measures is to enable the objective of no injury or death to koalas as a result of vehicle strike. No residual impacts can be identified.	Permanent speed limit signage and reduced speeds	During construction of roads	Vehicles speeding	No koala deaths from vehicle strike	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Low vehicle speeds will be signed and enforced as for public roads **No residual impact**
			Koala awareness signage installed where appropriate	At construction of roads and Council on-maintenance phase	Signs not installed	Signs installed progressively with construction of development	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Koala awareness signage will be delivered where appropriate under the SBMP. **No residual impact**
			Traffic calming devices to be installed through development	Traffic calming devices including speed bumps and chicanes are included in the development.	Calming devises not installed prior to public use of the road	Design of devices completed and installed	Engineer as appointed by the proponent responsible for design. Civil contractor responsible for installation.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**
			Urban landscaping avoids use of MNES species foraging trees	Landscape design phase and planting during construction	Koala trees inadvertently utilised in urban areas	Urban landscape planting palette designed during operational works phase. Planting delivered with non-Koala native species during construction.	Landscape architect and landscape contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**
Risk of injury or death from dog attack	Dogs will be kept on leads when outside of yards or not in designated dog off lead areas. Fauna awareness will be promoted through the installation of fauna awareness signage.	While dogs already occur within the local area, and wild dogs are known to occur on the site, the project will result in an increase in dog ownership numbers in the area. As such, the education of residents has been identified as a key management tool in reducing the risk or injury of dog attacks on koalas. Again, while the risk to grey-headed flying-fox is low, these measures will also be effective to reduce risk of dog attack on the species.	Dog restrictions including appropriate signage to promote responsible pet ownership including "dogs on leads at all times".	At delivery of pedestrian links and detention areas during construction	Dogs are let off their leads by residents in areas where koalas may be present.	Dog signage is designed and delivered. Council controls on dog ownership imposed.	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Dogs will be managed to Council specifications and prohibited from entering the vegetation retention areas **No residual impact**

5.4. Mitigation costs

An approximate cost for implementation of the proposed mitigation measures has been estimated at $50,000.

6. Proposed Offsets

Item 6 of the PD Request asks for ***"Where residual significant impacts remain to the MNES identified in part 3 after exhaustion of all reasonable avoidance and mitigation measures, a compensatory environmental offset in accordance with the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (EPBC Offsets Policy) may be required. Offsets must be specific to the species or ecological community being impacted, be like for like, and must improve or maintain the viability of the species. Offsets are not intended to make proposed actions with unacceptable impacts, acceptable."***

A significant impact is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is to be impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts.

It has been considered that the proposed action is likely to have a significant residual impact on Koala and Grey-headed Flying-fox. Several avoidance and mitigation measures relating to the construction and operation stages of the project are proposed which seek to reduce the potential for immediate and long-term impacts or indirect impacts on MNES and fauna generally.

6.1. Significant Residual Impact Summary

An impact of 7.38 ha of critical habitat for the Koala and 7.38 ha of potential foraging habitat for the Grey-headed Flying-fox habitat will occur from the direct clearing associated with the proposed action.

Koala:	**Removal of 7.38 hectares of critical habitat at a MHQA score of 5.69 (rounded to 6) with a quantum impact of 4.43 ha.**
Grey-headed Flying-fox:	**Removal of 7.38 hectares of foraging habitat at a MHQA score of 7.27 (rounded to 7) with a quantum impact of 5.17 ha.**

6.2. Offset Proposal

The Offset Proposal and accompanying Offset Management Plan (OMP) Saunders Havill and will be implemented by the offset provider (Auvergne Investments). The proposed offset includes the dedication and rehabilitation of 25 ha of single site offset solution (the 'Mount View Offset Area'). The Mount View Offset Area (MVOA), located as part of Lot 23 on RP47247 at Oaky Scrub Road, Oaky Creek, Queensland, 4285, will deliver overall 'conservation gain' for Koala and GHFF. The MVOA forms part of the Mount View Offset Property (MVOP) which adjoins remnant vegetation and is intended to provide multiple Federal offsets for Koala and other species.

The MVOA is currently intensively grazed with slashing and burning utilised to promote pasture grasses across the entire MVOP. Much of the area is highly disturbed by grazing activities and is dominated by cleared paddock with patches of retained regrowth eucalypt vegetation predominantly restricted to a waterway, Dip Gully, in the east of the MVOA

The MVOA as proposed will acquit the required impacts and provide additional benefit for the species. Key site details are provided in **Table A40**.

Table A40: Offset area summary

Address	**Oaky Scrub Road, Oaky Creek, Queensland, 4285**
Lot/Plan	Part of Lot 23 on RP47247
Area (ha)	25
Tenure	Freehold
Local Government Area	Scenic Rim Regional Council
Zoning	Rural

6.3. Offset Area Suitability

The suitability of the nominated Offset Area for the provision of habitat for Koala and Grey-headed Flying-fox is discussed in **Attachment 5** (OMP), **Section 4.1.9/Section 4.3.6** and **Table 8/Table 12** with regard to the EPBC Act Offset Policy Principles. Part of the Offset Area's suitability in the provision of the offset is its integration with surrounding ecological features such as the Queensland state mapped regional corridor and core Koala habitat, and the contribution to the extension of connected Category A, B and C Regulated Vegetation (RV).

6.4. Offset Management Plan

The OMP provides details on offset suitability, environmental outcomes, baseline survey methods and results and management framework. The objective of the OMP is to summarise existing habitat quality for the Koala and Grey-headed Flying-fox within the offset areas and to provide management actions designed to achieve the identified environmental outcomes.

The OMP identifies outcomes focused management actions pursuant the EPBC Act, for the provision of the Koala (*Phascolarctos cinereus*) habitat offset. The management objectives for the offset area, in alignment with the EOP will:

- Deliver an overall conservation outcome that improves the viability of habitat for the Koala and Grey-headed Flying-fox

- Provide a direct offset that is in proportion to the level of statutory protection that applies to habitat for the Koala and Grey-headed Flying-fox
- Be of a size and scale proportionate to the residual impacts on habitat for the Koala and Grey-headed Flying-fox
- 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 offset areas.

The achievement of environmental outcomes within the offset area will be measured using methodologies, monitoring and maintenance detailed in **Attachment A5**. The approval holder must apply management actions to achieve the prescribed outcomes at the offset areas.

6.5. Impact Compensation

The proposed offset area will acquit **110.60%** of the quantum impacts for Koala and 101.18% of the quantum impacts for Grey-headed Flying-fox (refer **Table A41**).

Table A41: Offset Area Koala MHQA offset improvement scores

Offset Area	Area (ha)	Habitat Quality Score		Offset Acquittal
		Baseline (rounded score)	Future (rounded score)	
Koala				
Assessment Unit 1	3.2	5	7	9.68%
Assessment Unit 2	1.2	5	7	3.63%
Assessment Unit 3	20.6	4	7	93.45%
Grey-headed Flying-fox				
Assessment Unit 1	3.2	5	8	15.18%
Assessment Unit 2	1.2	5	8	5.69%
Assessment Unit 3	20.6	3	7	114.94%



7. Economic and Social Matters

This section responds to Item 8 of the PD request which requests further details on economic and social matters, as follows:

a. ***Provide details on the social and economic costs and / or benefits of undertaking the proposed action, including the basis for any estimations of costs and / or benefits.***

b. ***Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.***

c. ***Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.***

d. ***Provide details of any consultation with indigenous stakeholders.***

7.1. Social and Economic benefits

The proposed development results in the creation of 127 new residential allotments, which are crucial in meeting the 2029 Queensland and National housing targets set out by the National Housing Accord. Indicators from the Australian Bureau of Statistics suggests that the rate of houses being built falls well below the 2029 targets. Research from the Property Council of Australia analysing these figures indicates that Queensland is currently predicted to be 96,000 homes behind the target set out for the state, which is the second largest shortfall behind New South Wales (Property Australia, 2025). As the population inevitably increases, falling short of these set targets only increases the demand for homes thus further inflating prices in a time where many Australian's are struggling to afford housing. Recent research from the Australia Institute has found it takes more than 10 years to save a 15 per cent deposit for a home in the Greater Brisbane area (Jericho, 2025). Economic Development Queensland (EDQ) has identified Ripley Valley as one of the largest urban growth areas which offers opportunities for residential growth to meet the regions affordable housing needs. As such, this development contributes towards the planning intent of the region and overall housing intent of Queensland and Australia as a whole, where more and affordable housing is desperately needed.

In addition to easing demands for housing, the construction and operation of the project will provide a number of economic benefits to the local and regional community. Firstly, the construction of the project is expected to take approximately 15 months. This will allow for the engagement of a number of trades and services from the local area to participate in the construction of the master planned community, bolstering employment opportunities within the region. Not only will this provide employment opportunities to the community, but it will provide an economic boost to local retailers and suppliers who are engaged to supply materials and goods for the project. Subsequently, the proposed development will have a positive economic impact on the local community, which will include direct and indirect employment starting with the current planning and design phase, then civil and building construction. The increased economic activity generated by the development will therefore flow into the local and broader community. A high-level economic analysis is included in **Table A42**.



Table A42: High level economic analysis

Subdivision Construction		
Estimated Construction Cost	$ 15,000,000	Incl. Civil, Electrical/Telecommunications & Landscaping
Total Economic Output	$ 43,500,000	Based on $1m input = $2.9m output
Total Jobs Supported	135	Based on $1m input = 9 Jobs Supported
Housing Construction		
Number of Lots	127	
Average House Build Cost	$ 350,000	Assumed Average Ripley Build Cost
Total Construction Cost	$ 44,450,000	Number of Lots x Average Build Cost
Total Economic Output	$ 126,905,000	Based on $1m input = $2.9m output
Total Jobs Supported	263	Based on $1m input = 6 Jobs Supported
Overall Development		
Total Economic Output	$ 170,405,000	Subdivision + Housing Economic Output

During the preparation of the Ripley Valley Urban Development Area Development Scheme, EDQ consulted with ICC, the State Government and the community. The development scheme was publicly notified from the 1st of April to the 10th of May 2011, in accordance with the requirements of the *Urban Land Development Authority Act 2007* (Qld). In addition, EDQ hosted a number of community information sessions to provide opportunities for the public to view details of the proposed development scheme and speak with EDQ staff. Submissions were received during the public notification period in regard to the proposed development scheme, which were taken into consideration before the scheme was submitted to the minister for approval.

The Ripley Valley Submissions Report includes a summary of key issues raised in the submissions received during the public notification of the development scheme. Feedback was provided to the 30 submissions which included ICC, developers and community/interest groups with comments incorporated into the final amendment of the development scheme.

The Ripley Valley Urban Development Area Development Scheme outlines notification requirements for EDQ development applications and provides an opportunity for people to make submissions on the same. In deciding a PDA development application, EDQ must consider any submissions made to it about the application during the submission period. The proposal is in accordance with the PDA Development Scheme which was informed by community consultation.

7.1.1 Social benefits

Social impacts have been a key consideration in the design and planning of the project and more broadly the RVPDA. Under the provisions of the RVPDA Development Scheme, guidelines are set out for proposed developments to deliver suitably designated neighbourhoods, centres, housing diversity and affordability, employment opportunities, movement networks, community greenspace networks, community facilities, natural and cultural values, community safety and development constraints, service infrastructure and other general requirements.

The project facilitates an integrated residential community that promotes a variety of housing options and will provide a range of lot sizes to meet the diverse needs of different community members. The project will balance the needs of the community by providing:



- neighbourhood parks and pocket parks
- Pedestrian paths to encourage an active lifestyle

7.1.2 Economic benefits and employment opportunities

The economic benefits discussed above are entirely in addition to what would have been expected if the action were not to take place. Without the proposed action, the land would likely continue to be leased for cattle grazing which would create a moderate, inconsistent benefit for a handful of people, compared to significant benefit for a community as well as an alleviation on the strain of housing demand in the area.

7.1.3 Public / stakeholder consultation

Public consultation is to be completed in accordance with the State approval (application number 4815/2024/PDA) and will be completed as per the EPBC Act approval.

7.1.4 Indigenous stakeholder consultation

Cultural Heritage Management Plan was approved in October 2024 with management recommendations provided.

8. Ecological Sustainable Development

This section responds to Item 9 of the PD Request which asks the proponent to, *provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act.*

The EPBC Act has a key objective to *'promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resource,'* (EPBC Act section 3). Ecologically Sustainable Development (ESD) is defined within the Commonwealth Government's National Strategy for Ecologically Sustainable Development as *'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased'*. **Table A43** assesses the capacity for this project to meet the principles of ESD, as defined in section 3A of the EPBC Act.

Table A43: Principles of ESD defined under the EPBC Act, section 3A

Principles of ecologically sustainable development defined under Section 3A of the EPBC Act
a. ***Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.***
The design of the project has taken both long-term and short-term economic, environmental, social and equitable considerations into account. Local planning has identified the area as suitable for residential development, with the surrounding area designated under Urban living, a proposed rail corridor approximately 500 m south of the referral area. The project will benefit individuals and the community as a whole by providing additional housing, crucial as the supply of affordable housing is diminishing, within an area earmarked for urban development to support ongoing population growth. Residential uses are dominant in the area with major road networks present throughout including the Centenary Highway and Cunningham Highway which act as significant barriers to wildlife movement. The subject site contains a small, highly isolated pocket of vegetation surrounded on all sides by development and roads. A variety of housing types and densities will be made available in accordance with local planning intent, ensuring that a diverse range of people will have access to appropriate housing that suits their needs and preferences. The entire referral area will be impacted to facilitate the proposed residential development, with green spaces confined to pedestrian links and drainage reserve. The project does not propose any open space areas given the small overall area and complete lack of any ecological linkages off-site. Retaining vegetation is not considered appropriate due to the planning intent of the area and high risk of threats (vehicle strike and dog attack) once all surrounding development approvals are completed.

b. ***If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.***

The implementation of precautionary measures in decision making is used where there is a threat of serious or irreversible harm and where there is scientific uncertainty as to the extent of possible environmental damage. There are a number of factors which help determine whether or not an action might cause serious or irreversible environmental damage, including:

I. The spatial scale;
II. The magnitude of possible impacts;
III. The perceived value of the threatened environment;
IV. The complexity and connectivity of possible impacts;
V. The manageability of possible impacts;
VI. The level of public concern and the rationality or scientific basis for the concern; and
VII. Reversibility of possible impacts.

Impacts to the Koala and associated habitat have been identified as the primary environmental concern on a level of National Environmental Significance. The potential for the site to provide critical habitat for the Koala has been discussed in detail throughout this report. The site has been recognised to support low level Koala activity and an area of 7.38 hectares has been identified as containing habitat critical to the survival of the Koala. The vegetation on-site also provides potential foraging habitat for Grey-headed Flying-fox.

A number of possible impacts have been identified to these species as a result of the project; however, these are all considered to be localised impacts. The magnitude of impacts is considered small and restricted to the referral site, which is a result of the lack of surrounding vegetation, presence of existing roads and residential properties. Impacts can be summarised as those arising from the loss of habitat, injury or death from vehicle strike or dog attack and dispersal into residential areas. A number of management measures will be imposed to avoid and mitigate these impacts, which have been discussed in **Section 5** of this document. It is unsuitable to promote fauna movement onto the site given the abundance of threats in the local area and lack of adjacent vegetation, which will increase as the surrounding approved developments continue to be constructed. Therefore, no open space/conservation areas are proposed.

No parks or open space areas are proposed as a part of the development and therefore the risk of dog attack is considered minimal. The impacts from the project have been identified and management measures have been subsequently developed.

The proposed action is not considered to pose a threat of serious or irreversible damage to the local Koala or GHFF population or the broader environment. Potential impacts have been considered, and management plans will be in place to ensure that any impacts are minimised and offset.

c. ***The principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.***

The site was identified as containing ecological value in the form of Eucalypt woodland, however the context of the site, surrounded by roads and urban development on all sides, means that the vegetation is largely redundant. As a result, ecosystem function is significantly limited and therefore, vegetation is not intended to be retained as it would not provide a functional corridor or refuge for threatened species.

d. ***The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.***

Field surveys identified the site as containing a dominance of eucalypt woodland with some evidence of historical logging observed. Natural ecosystem processes are limited due to the highly isolated nature of the site and overall small area. Biological diversity and ecological integrity have been considered on-site however, the proposed development aligns with the zoning intent of the RVPDA, which focuses development in 'urban living' areas and retained vegetation in 'environmental protection' zones. It is therefore not realistic to retain vegetation on-site that does not currently provide ecological linkages or in the future.

e. ***Improved valuation, pricing and incentive mechanisms should be promoted.***

This project has taken into account the *EPBC Act Offsets Policy*, which provides for the cost-effective analysis of proposed offsets.



9. Environmental record

Item 10 of the PD Request asks for, ***"The information provided must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:***

- ***a) The person proposing to take the action;***
- ***b) For an action for which a person has applied for a permit, the person making the application;***
- ***c) If the person is a body corporate – the history of its executive officers in relation to environmental matters; and***
- ***d) if the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers."***

HB QLD Pty Ltd has a history of delivering projects with a satisfactory record of responsible environmental management. HB QLD Pty Ltd delivers land estates in both SEQ and Victoria to a high standard. HB QLD Pty Ltd has received and delivered on two EPBC approvals and offsets on sites in both Ripley Valley and Collingwood Park QLD. HBD QLD Pty Ltd does not have any present proceedings under Commonwealth, State or territory law for the protection of the environment or the conservation and sustainable use of natural resources.

10. Conclusion

The *Environmental Management Division* of SH were commissioned to collate and provide Preliminary Documentation to support assessment of the proposed action (the Ripley Residential Development, 187-197 Binnies Road, Ripley, QLD) under the EPBC Act. The proposed action is a residential development at Binnies Road, Ripley, in South East Queensland. A Controlled Action assessment through Preliminary Documentation was determined for the development on 5 July 2024 (EPBC 2024/09865), in response to the submitted Referral on behalf of the proponent, HB QLD Pty Ltd. The decision was based on:

- Listed threatened species and ecological communities (s18 & s18A).

This Preliminary Documentation Report provides information requested by the DCCEEW to assist the assessment manager in granting an approval. As detailed in previous referral documentation and this report, SH determines that the proposal will result in the clearing and functional loss of 7.38 ha of habitat critical to the survival of the Koala and Grey-headed Flying-fox. The proposal has been deemed to impose a significant impact on Koala and Grey-headed Flying-fox and therefore an offset is required. The Proponent will provide an offset in accordance with the EPBC Act's Environmental Offset Policy which fully equites impact to both Koala and Grey-headed Flying-fox.

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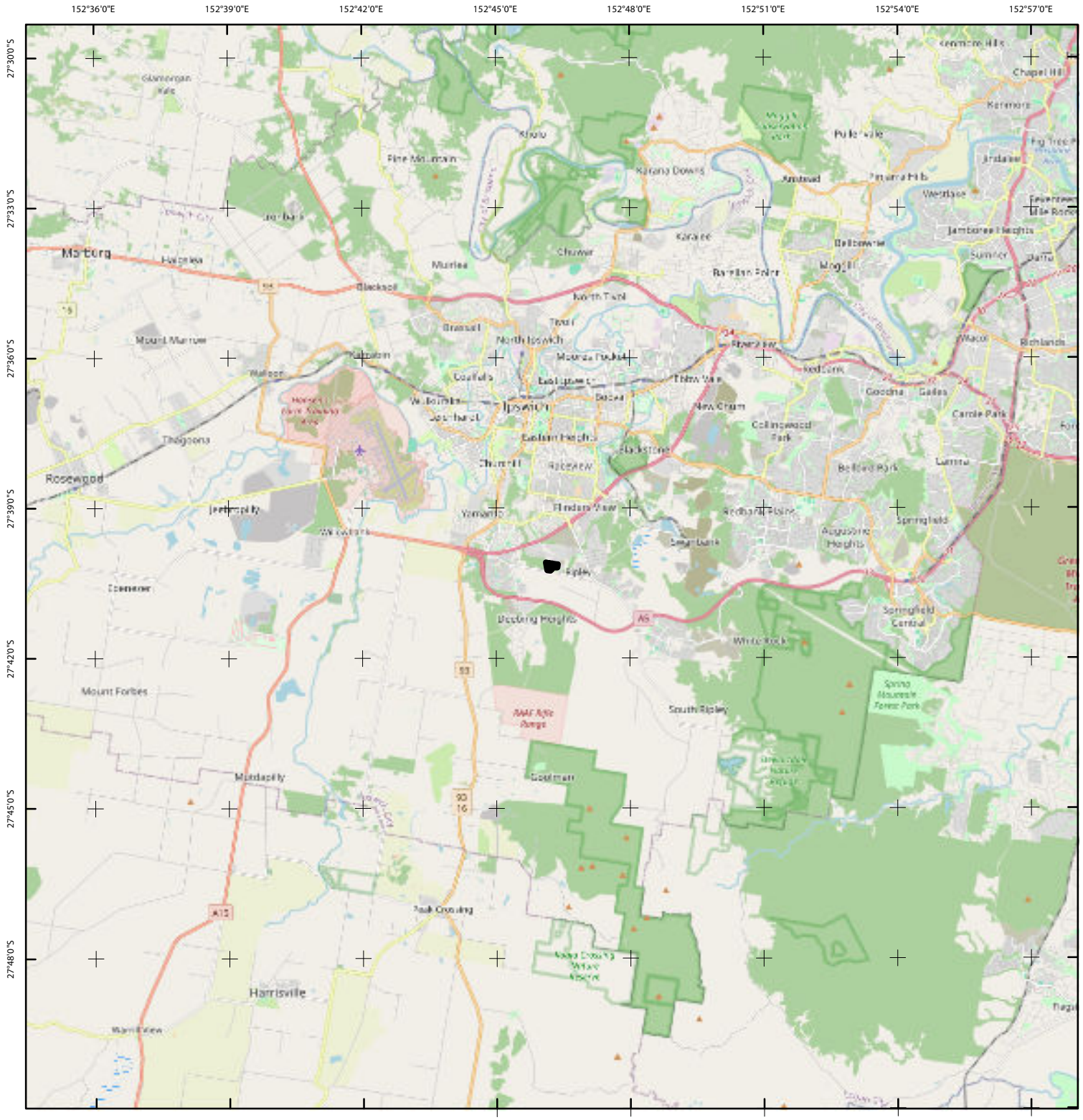
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12. Figures and Plans

Figure A1: Site Context
Figure A2: Site Context

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Plan A3: Surrounding Approvals
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LEGEND

Site DCDB

Figure 1

Site Context

FILE REFERENCE
11826 E Figure 1 Site Context A_

DATE
8/07/2025

BINNIES ROAD, RIPLEY

0 2,600 5,200 7,800 m

N

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:200,000

CLIENT

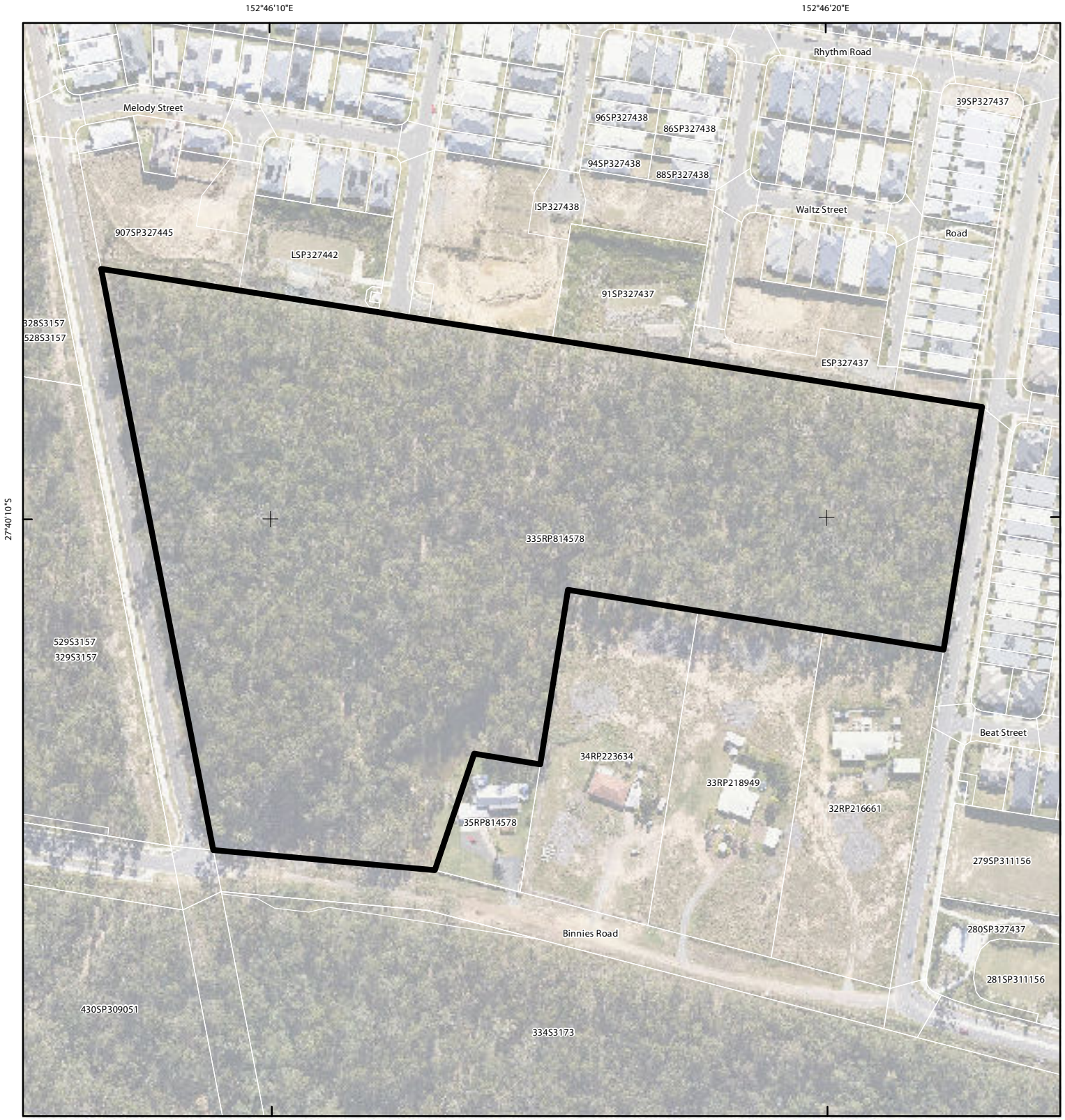
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LEGEND

Site DCDB

Qld DCDB

Figure 2

Site Aerial

CLIENT

HB QLD
PTY LTD

FILE REFERENCE
11826 E Figure 2 Site Aerial A_

DATE
8/07/2025

BINNIES ROAD, RIPLEY

0 20 40 60 80 m

N

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:2,600

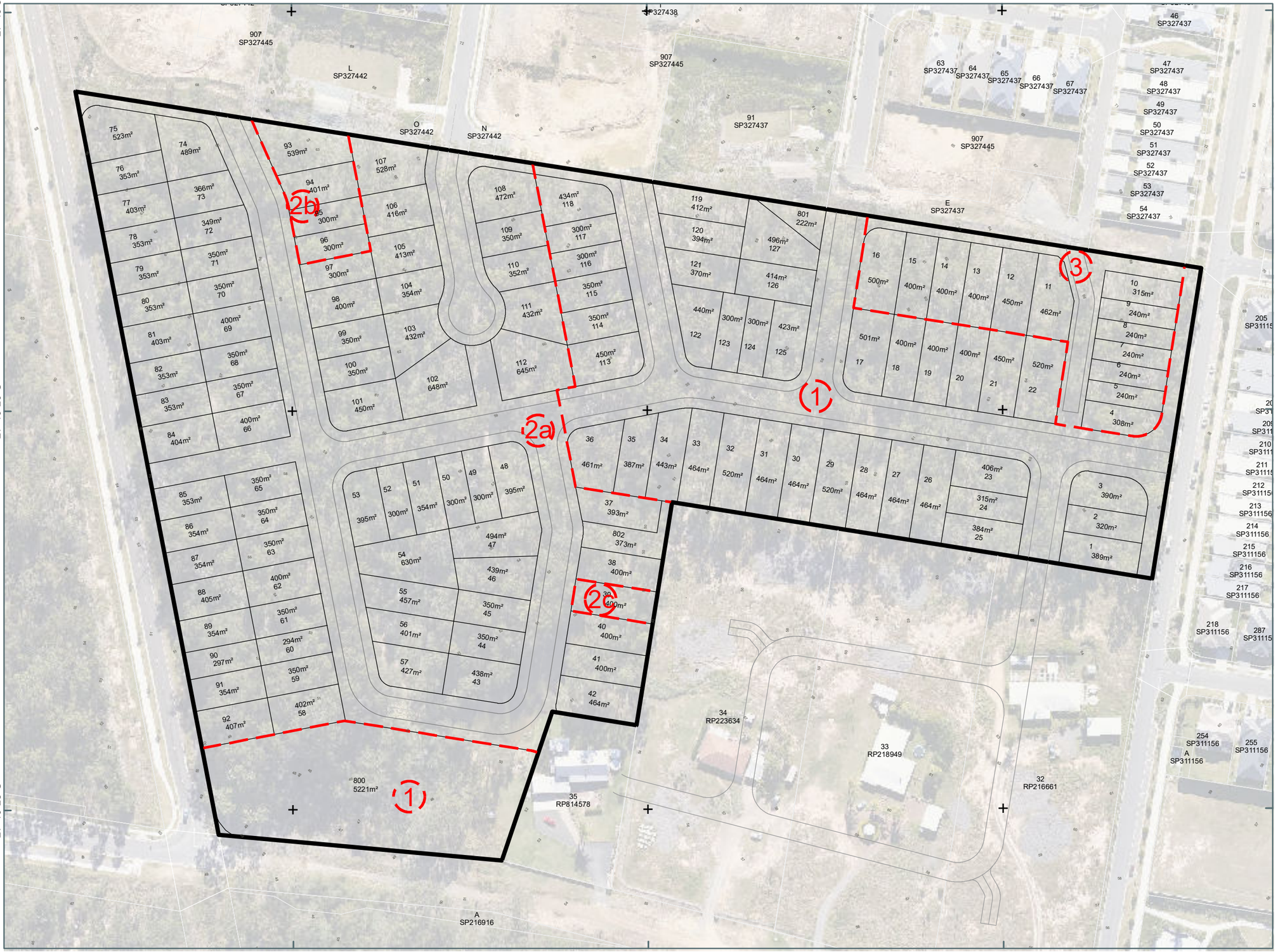
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A01. DEVELOPMENT LAYOUT



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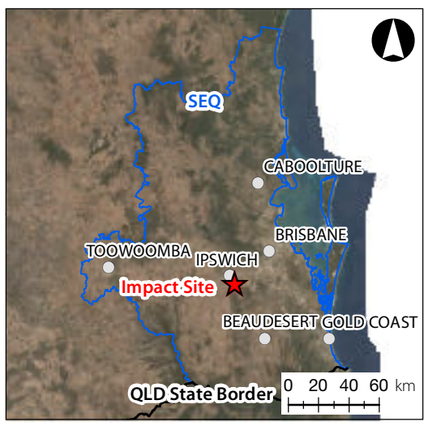
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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LEGEND

- Qld DCDB
- Referral Area
- Lot Design
- Road Design
- Stage Boundary



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BINNIES ROAD, RIPLEY

0 20 40 m
Transverse Mercator
GDA 2020 | Zone 56

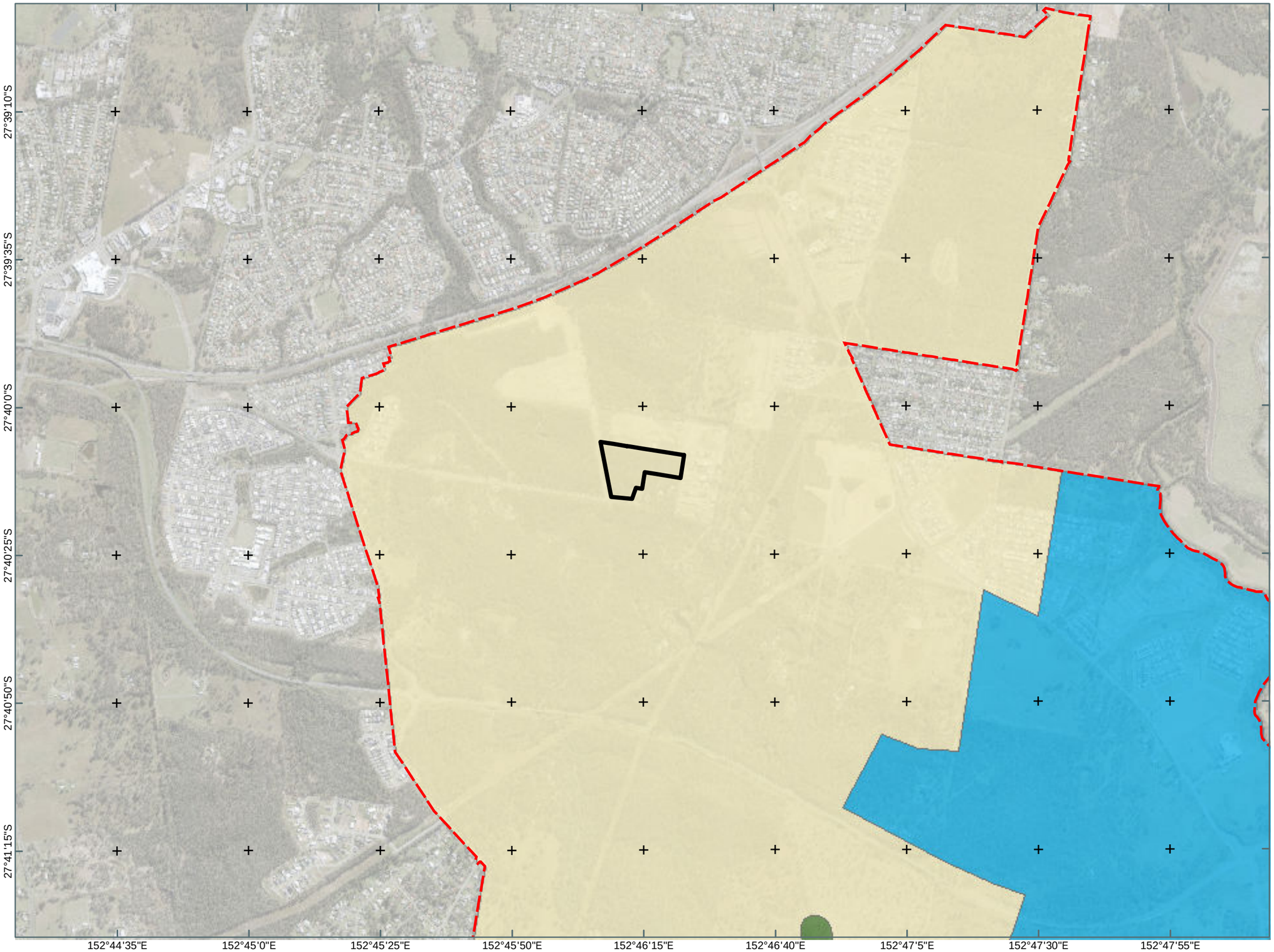
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1:1,500 @ A3

Address / RPD: *Lot 335 on RP814578*

7/07/2025

11826 E A01 Development A_

A02. DEVELOPMENT LAYOUT



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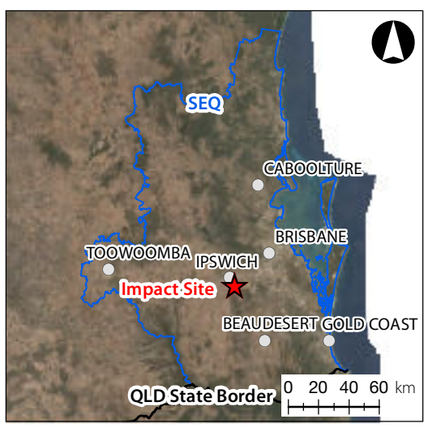
Updated data available at
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LEGEND

- Referral Area
- Ripley Valley PDA Boundary

PDA Zoning

- Urban Core
- Urban Living
- Environmental Protection



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BINNIES ROAD, RIPLEY

0 250 500 m

Transverse Mercator
GDA 2020 | Zone 56

N

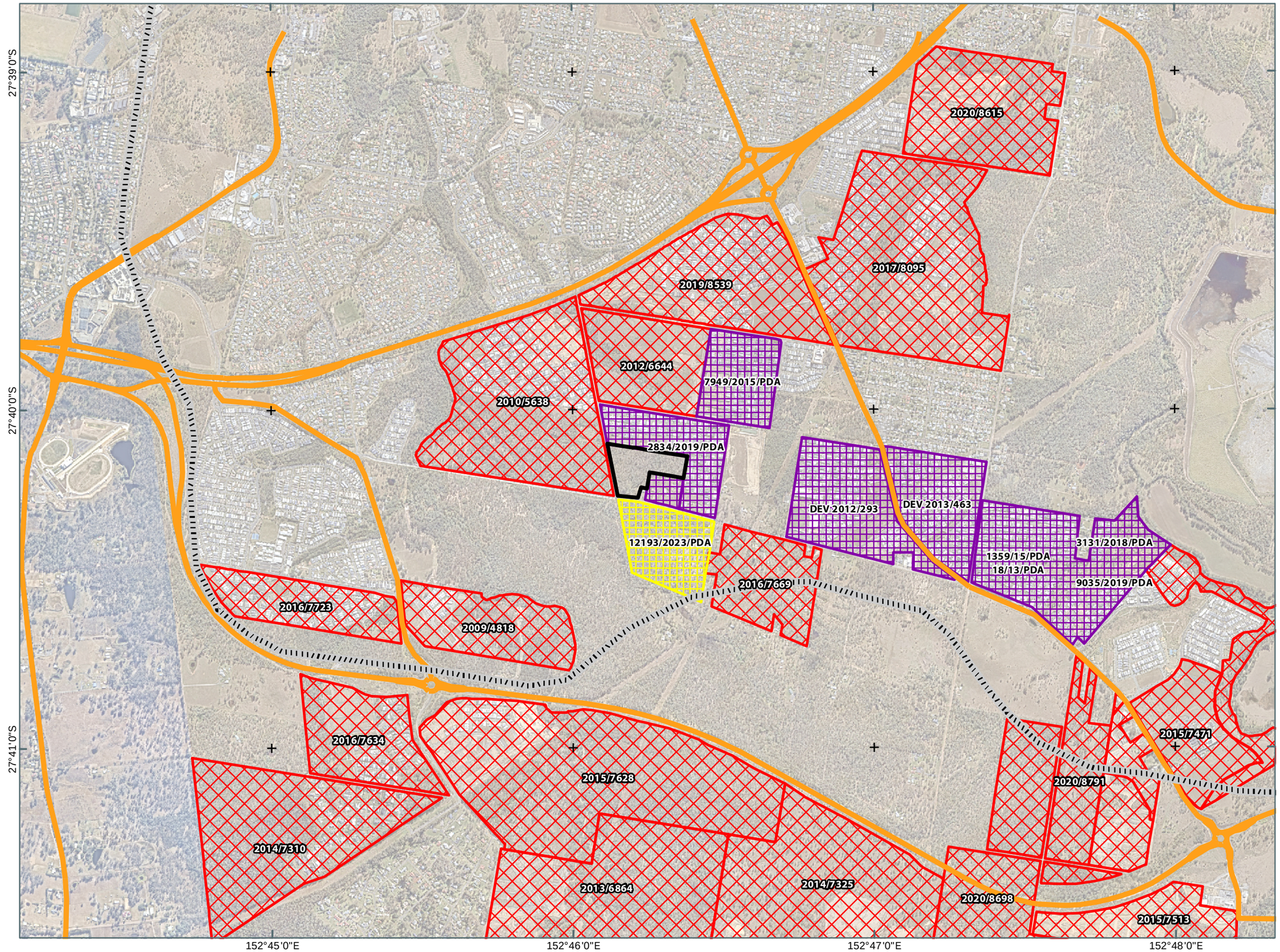
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11826 E A02 RV PDA A_

A03. SURRONDING APPROVALS



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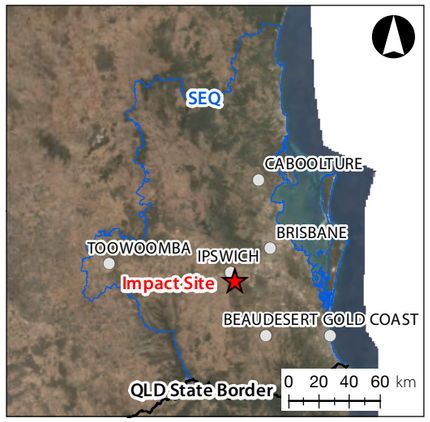
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LEGEND

- Referral Area
- EDQ DA Approved Sites
- EDQ DA Application Sites
- EPBC Approvals / 'NCA' determinations
- Major Roads
- Future rail corridor



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BINNIES ROAD, RIPLEY

0 300 600 m

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N

1:21,000 @ A3

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16/12/2025

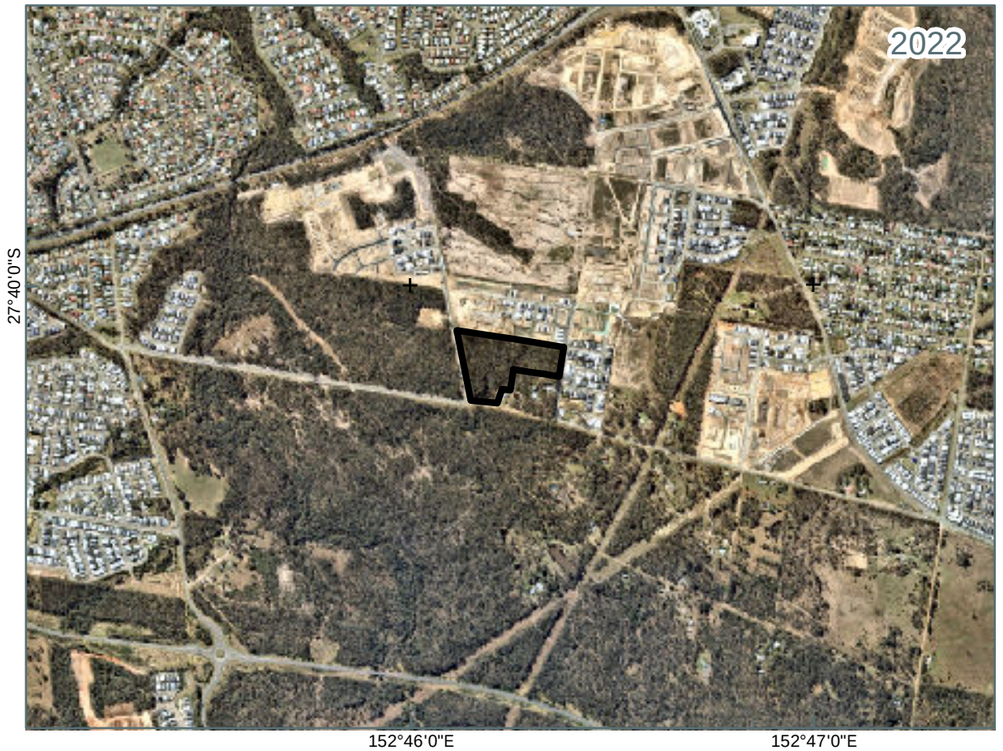
11826 E A03 Surronding Approvals A

A04. DEVELOPMENT LAYOUT









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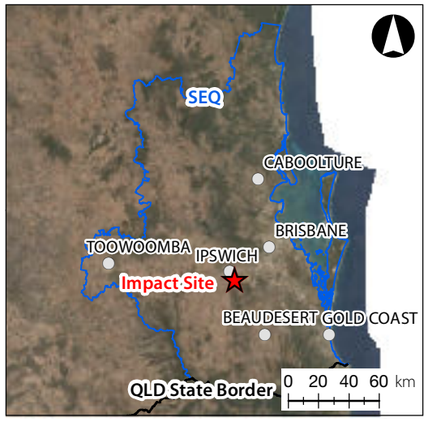
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LEGEND

- Qld DCDB
- Referral Area



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0 300 600 m
Transverse Mercator
GDA 2020 | Zone 56

N
1:25,000
@ A3

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11826 E A04 Aerial History A_

A05. TOPOGRAPHY



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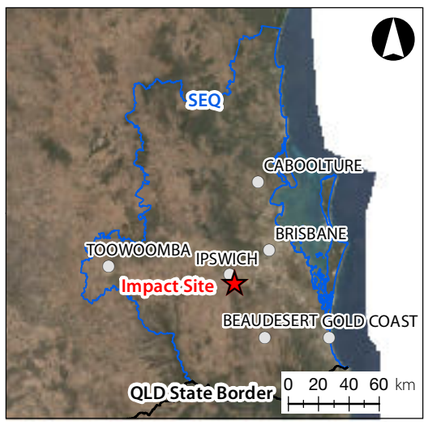
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LEGEND

- Qld DCDB
- Referral Area
- Water Act Drainage Feature

1m Contours

- 37 - 44m AHD
- 45 - 51m AHD
- 52 - 58m AHD
- 59 - 65m AHD
- 65 - 72m AHD
- >72m AHD



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BINNIES ROAD, RIPLEY

0 20 40 m

Transverse Mercator
GDA 2020 | Zone 56

N

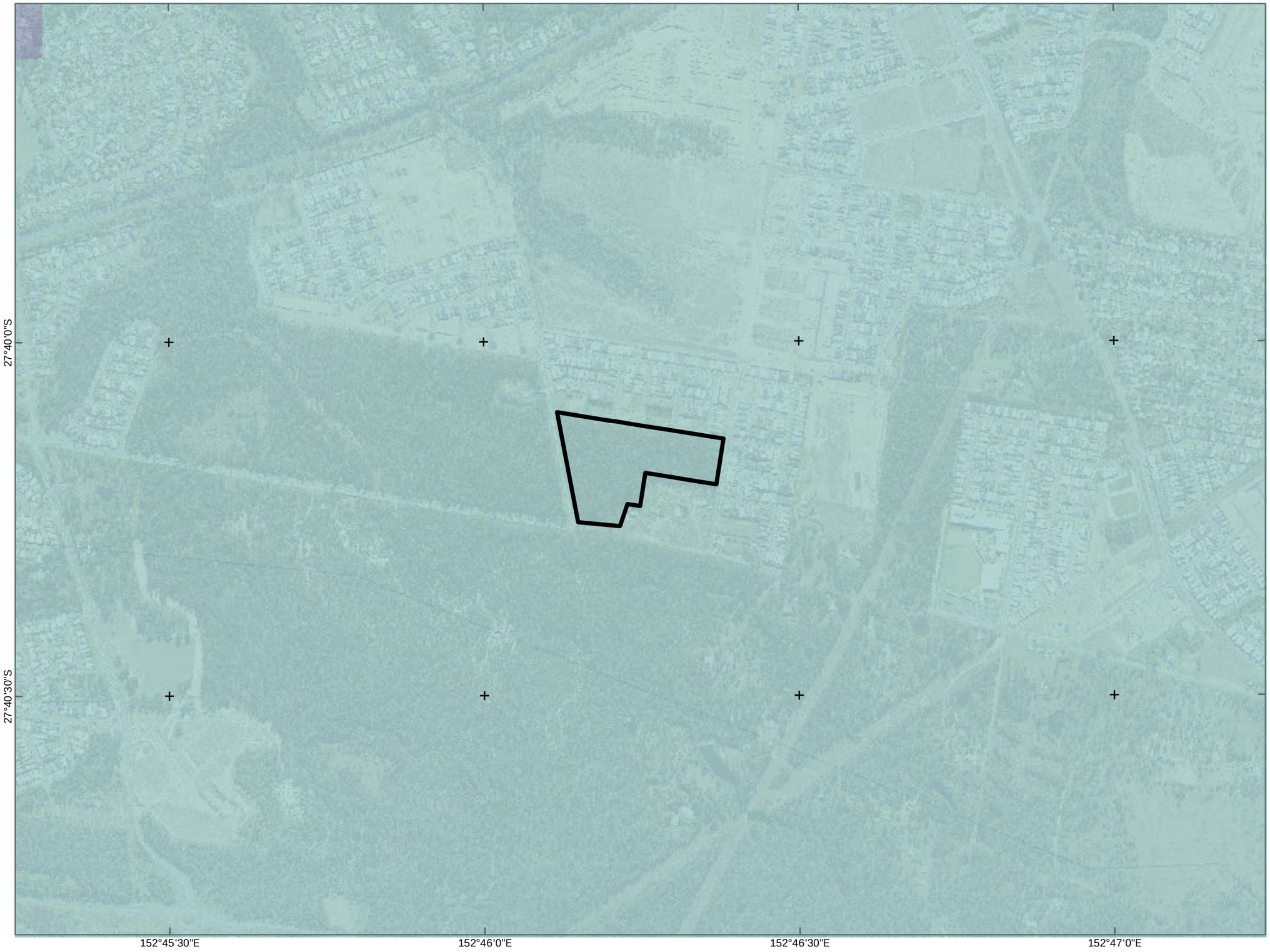
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11826 E A05 Topography A_

A06. ASIRIS SOIL CLASSIFICATION (LEVEL 5)



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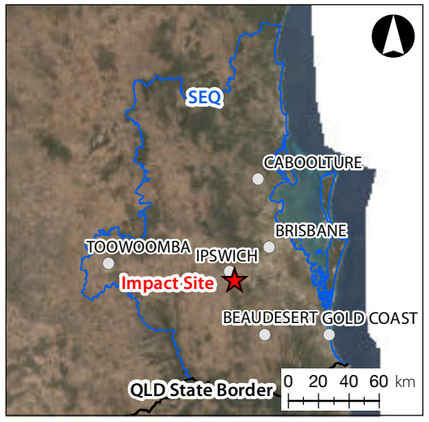
LEGEND

Referral Area

Australian Soil Classification

Sodosols

Vertosols



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0 100 200 m

Transverse Mercator
GDA 2020 | Zone 56

N

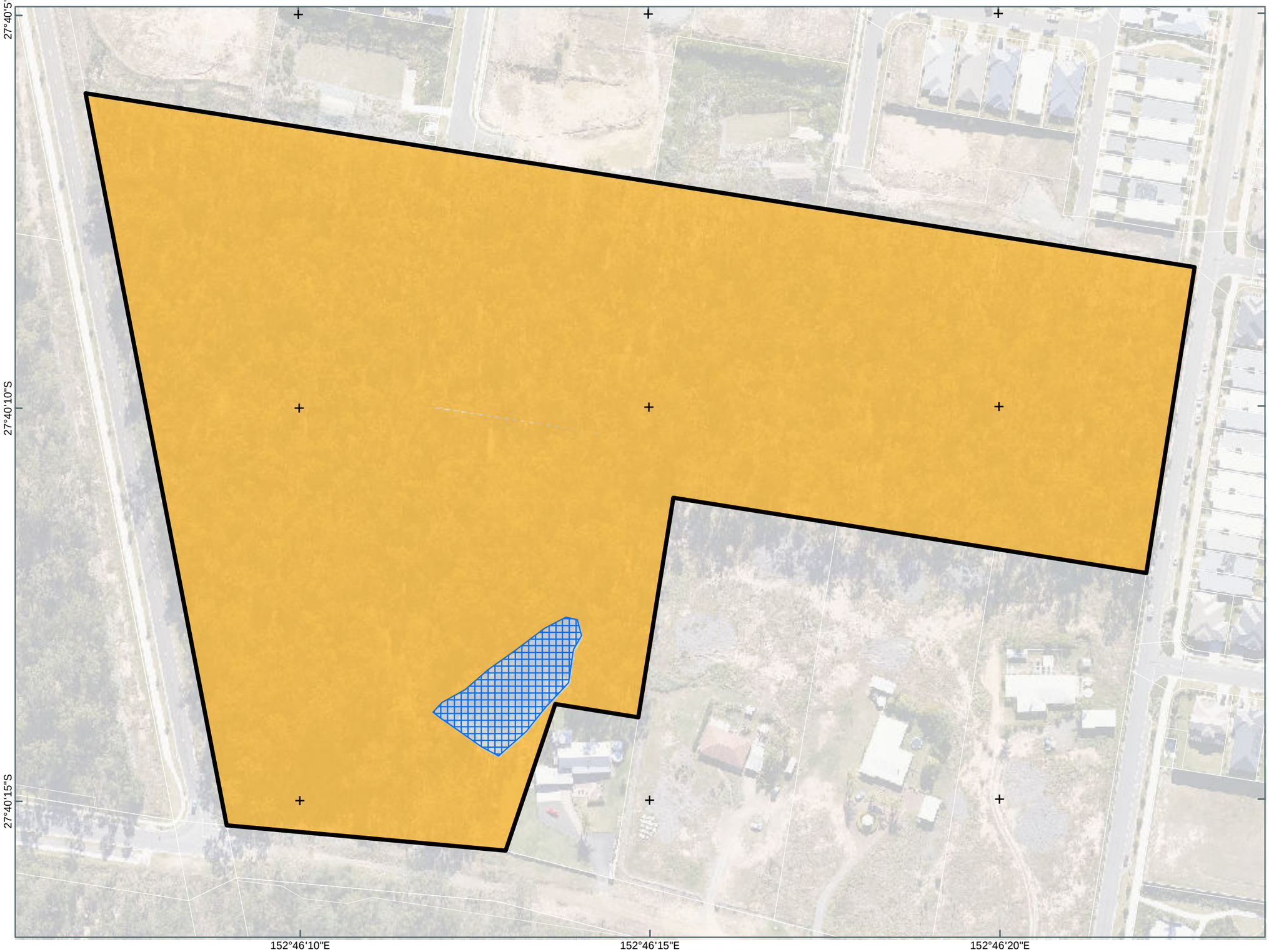
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11826 E A06 Soils A_

A07. VEGETATION COMMUNITIES



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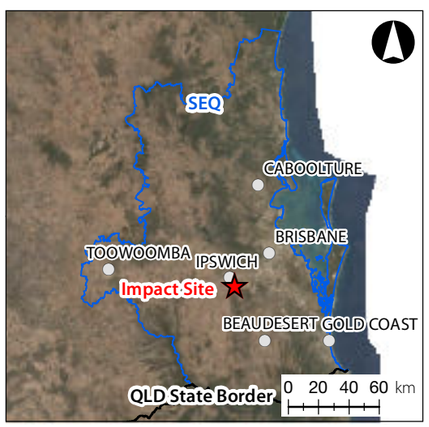
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LEGEND

- Qld DCDB
- Referral Area
- Constructed Dam [0.14 ha]
- AU1 – RE12.9.10.2 [7.38 ha]



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BINNIES ROAD, RIPLEY

0 20 40 m

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GDA 2020 | Zone 56

N

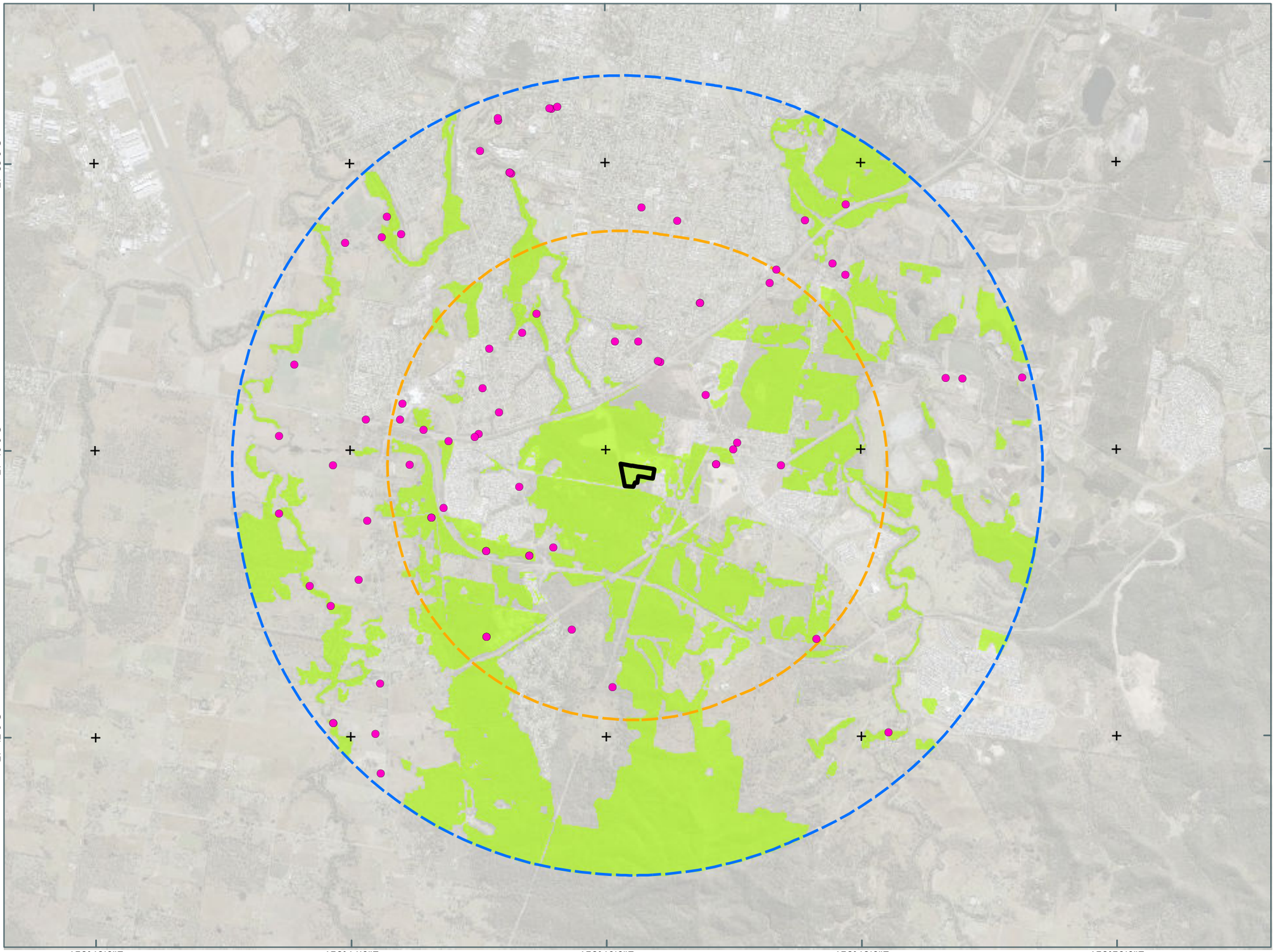
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Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A07 Vegetation Communities A_

A08. KOALA HABITAT AND RECORDS



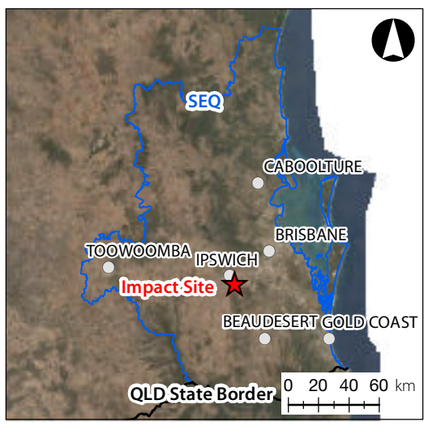
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LEGEND

- Referral Area
- Referral Area 3km Buffer
- Referral Area 5km Buffer
- Potential and Known Koala Habtiat within 5km of Referral Area [28%]
- Koala Records within the last 20 years (ALA, 2025) [77]



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BINNIES ROAD, RIPLEY

0 500 1,000 m
Transverse Mercator
GDA 2020 | Zone 56

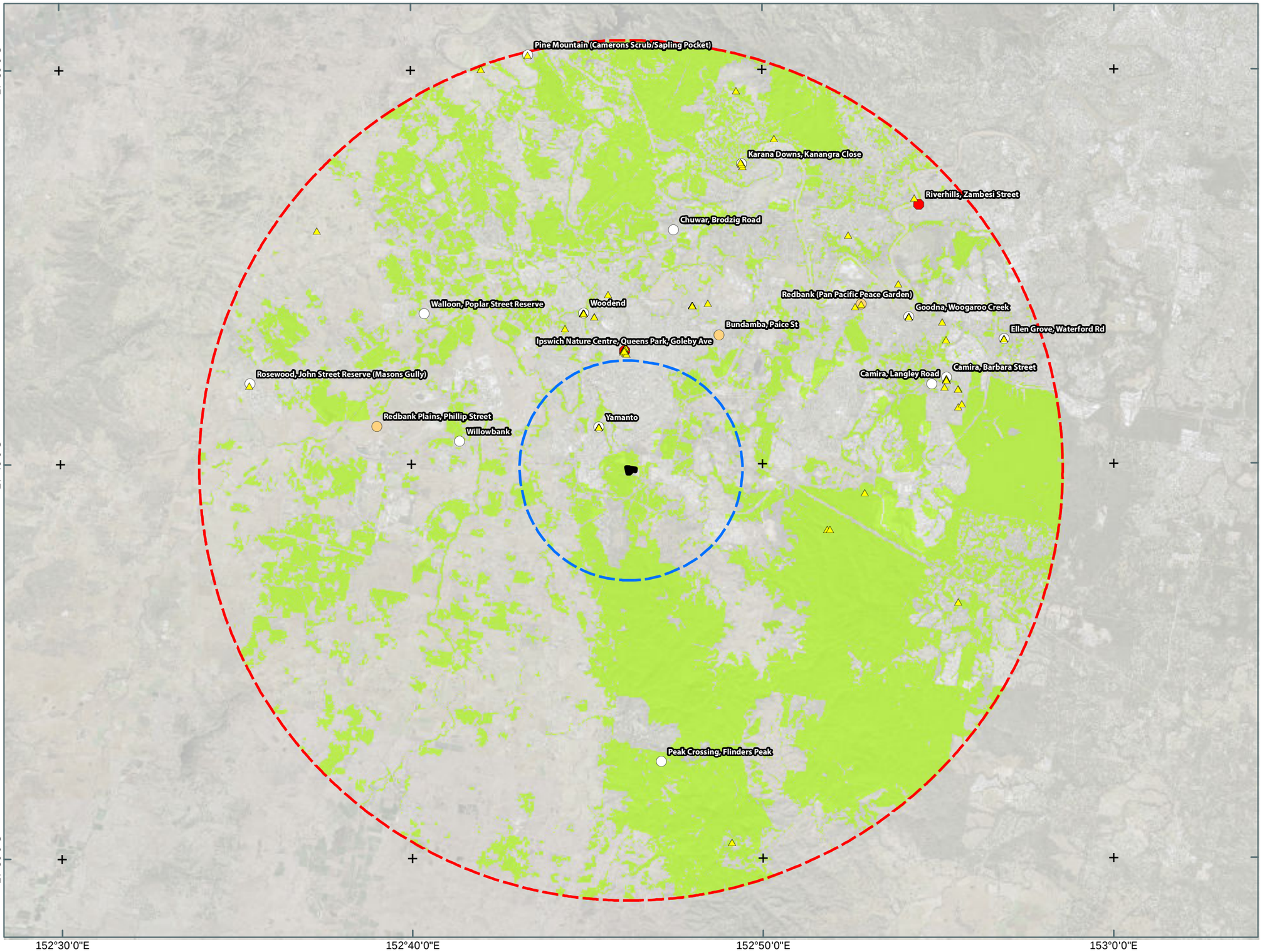
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1:50,000
@ A3

Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A08 Koala Records A_

A09. GREY-HEADED FLYING-FOX HABITAT AND RECORDS



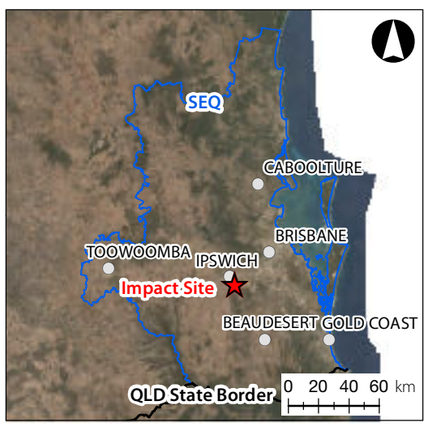
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LEGEND

- Referral Area
- Referral Area 5km Buffer
- Referral Area 20km Buffer
- Potential and Known Grey-headed Flying-fox Habtiat within 5km of Referral Area [37%]
- Grey-headed FLying-fox Records within the last 20 years (ALA, 2025) [233]
- Grey-headed Flying-fox roost inactive within recent surveys [13 within 20km]
- Grey-headed Flying-fox roost active within recent surveys [3 within 20km]
- Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [2 within 20km]



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BINNIES ROAD, RIPLEY

0 2 4 km
Transverse Mercator
GDA 2020 | Zone 56

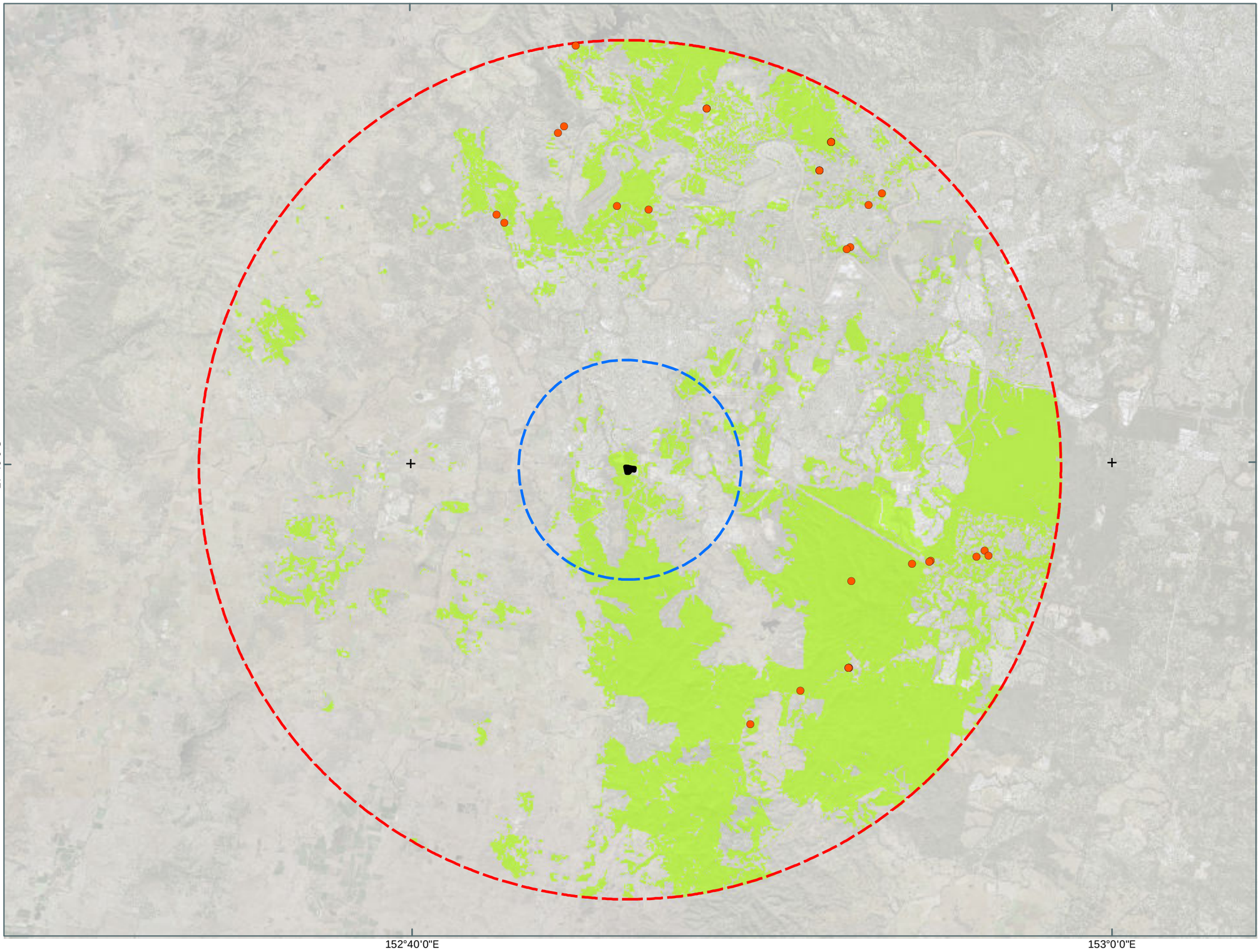
N
1:180,000
@ A3

Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A09 GHFF Records A_

A10. SOUTH-EASTERN GLOSSY BLACK-COCKATOO HABITAT AND RECORDS



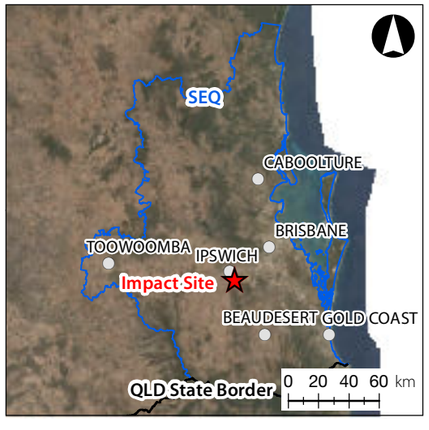
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LEGEND

- Referral Area
- Referral Area 5km Buffer
- Referral Area 20km Buffer
- Potential and Known South-eastern Glossy-black Cockatoo Habtiat within 5km of Referral Area [26%]
- South-eastern Glossy-black Cockatoo Records within the last 20 years (ALA, 2025) [33]



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BINNIES ROAD, RIPLEY

0 2 4 km
Transverse Mercator
GDA 2020 | Zone 56

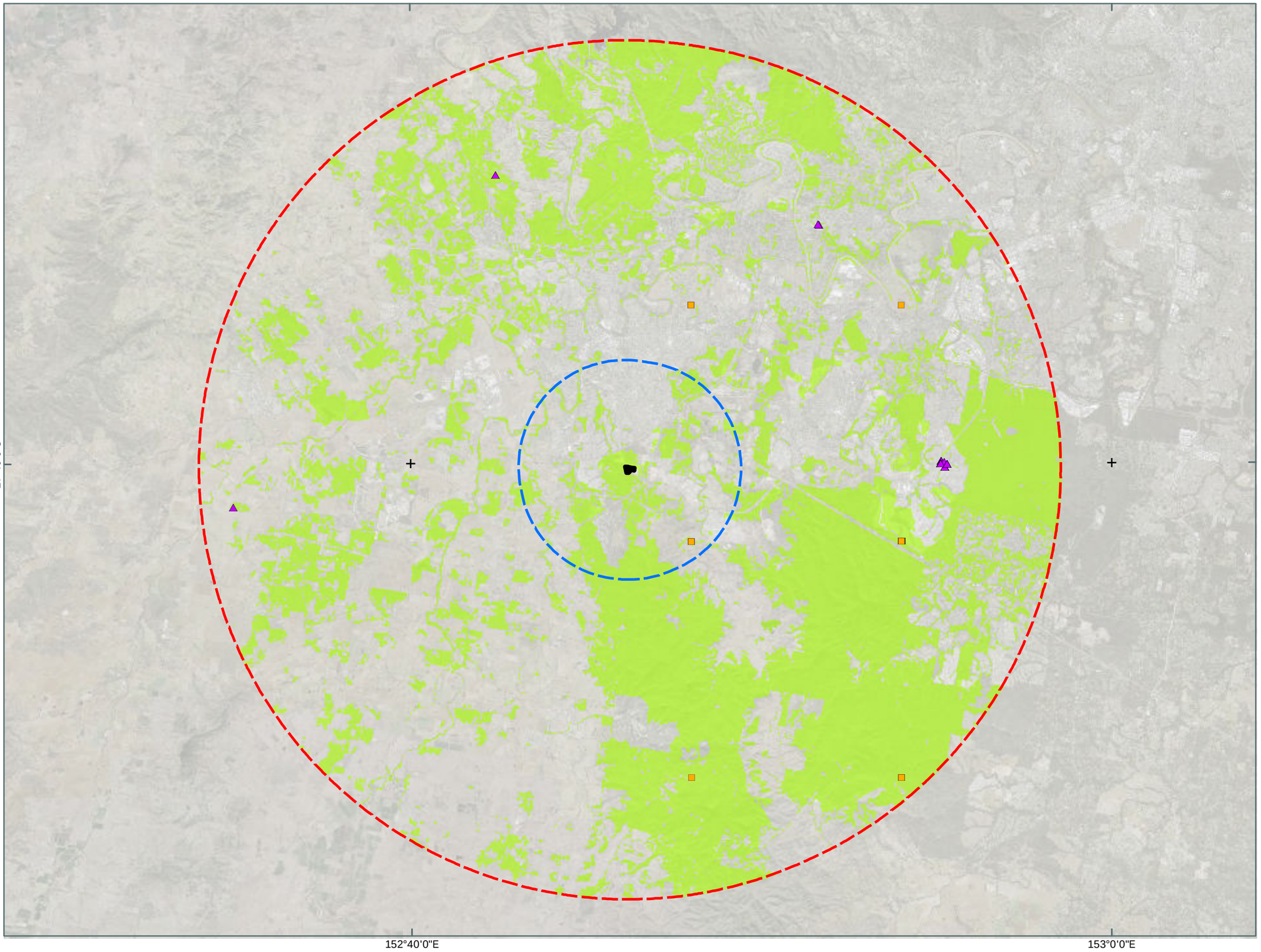
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Address / RPD: *Lot 335 on RP814578*

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11826 E A10 GBC Records A_

A11. SWIFT PARROT AND REGENT HONEYEATER HABITAT AND RECORDS



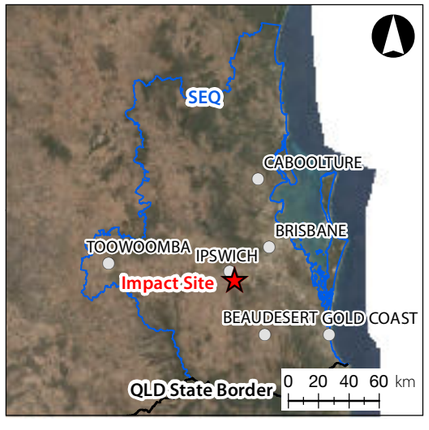
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LEGEND

- Referral Area
- Referral Area 5km Buffer
- Referral Area 20km Buffer
- Potential and Known Swift Parrot and Regent Honeyeater Habtiat within 5km of Referral Area [37%]
- Swift Parrot Records within the last 20 years (ALA, 2025) [19]
- Regent Honeyeater Records within the last 20 years (ALA, 2025) [178]



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BINNIES ROAD, RIPLEY

0 2 4 km
Transverse Mercator
GDA 2020 | Zone 56

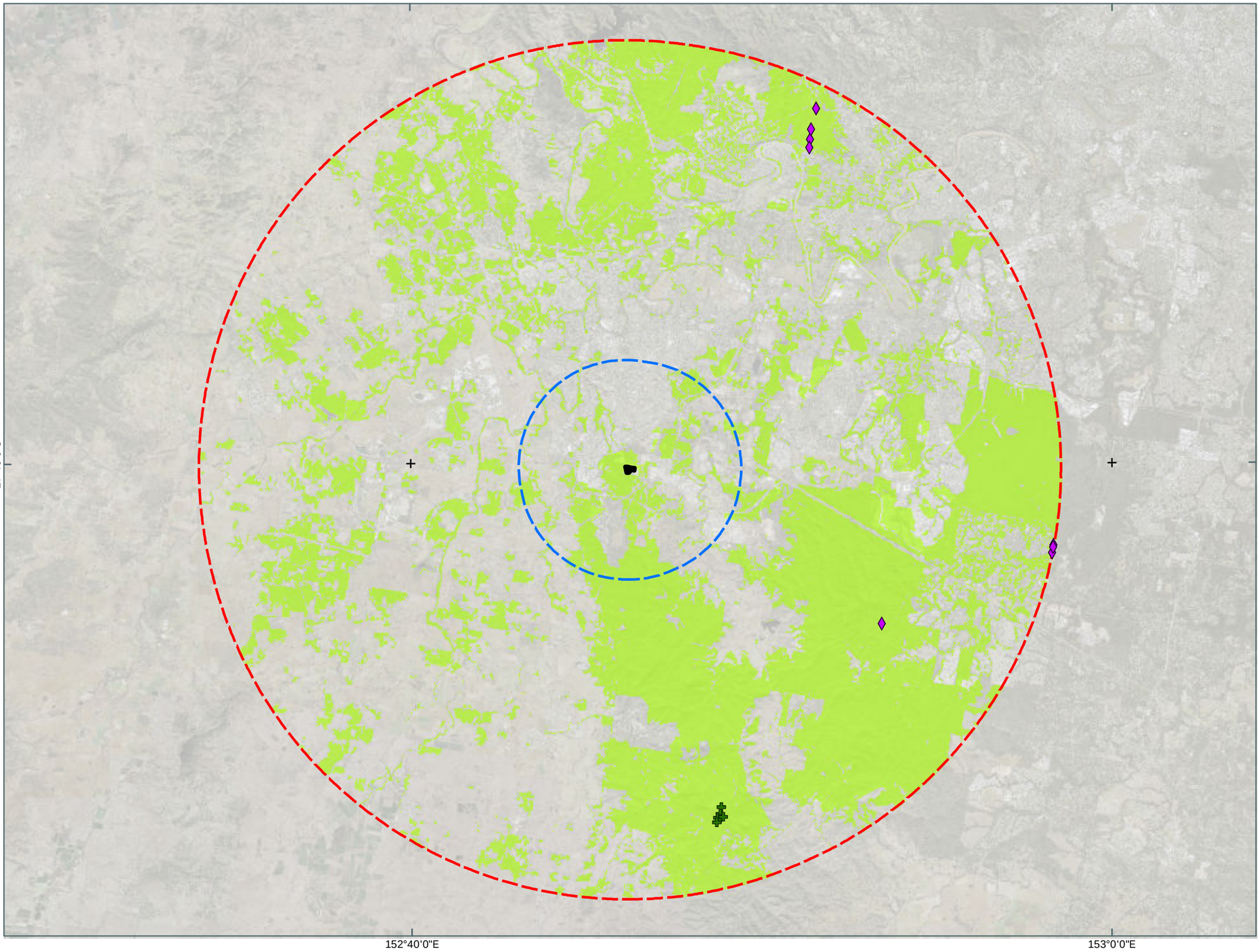
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1:180,000
@ A3

Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A11 SP RH Records A_

A12. GREATER GLIDER HABITAT AND RECORDS



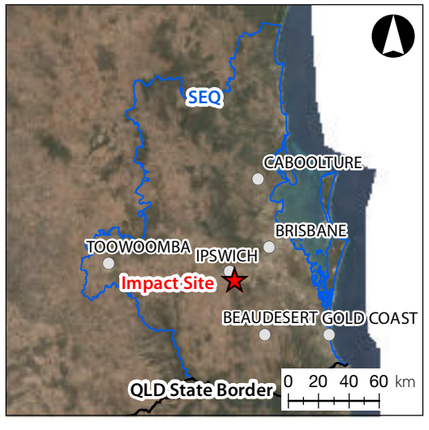
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LEGEND

- Referral Area
- Referral Area 5km Buffer
- Referral Area 20km Buffer
- Potential and Known Greater Glider Habtiat within 5km of Referral Area [36%]
- Central Greater Glider Records within the last 20 years (ALA, 2025) [6]
- Southern Greater Glider Records within the last 20 years (ALA, 2025) [8]



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BINNIES ROAD, RIPLEY

0 2 4 km
Transverse Mercator
GDA 2020 | Zone 56

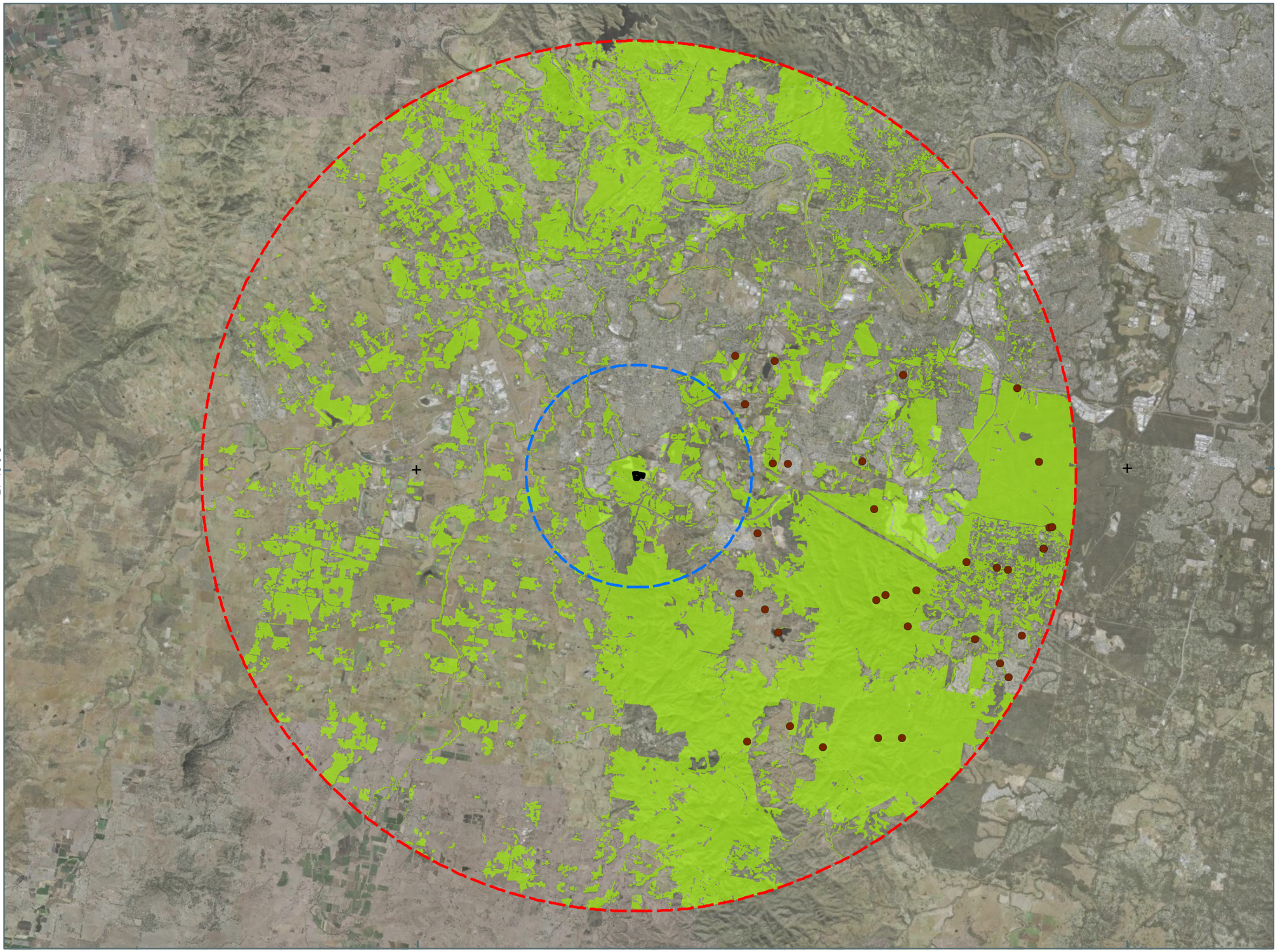
N
1:180,000
@ A3

Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A12 GG Records A_

A13. YELLOW-BELLIED GLIDER HABITAT AND RECORDS



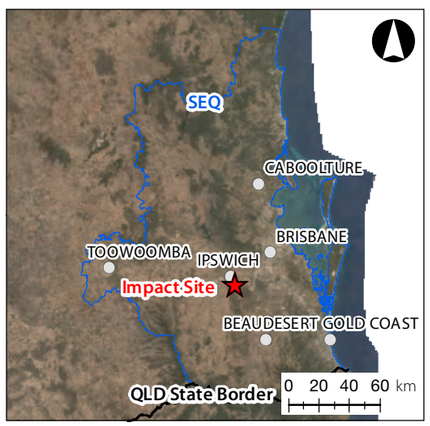
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LEGEND

- Referral Area
- Referral Area 5km Buffer
- Referral Area 20km Buffer
- Potential and Known Greater Glider Habtiat within 5km of Referral Area [37%]
- Yellow-bellied Glider Records within the last 20 years (ALA, 2025) [34]



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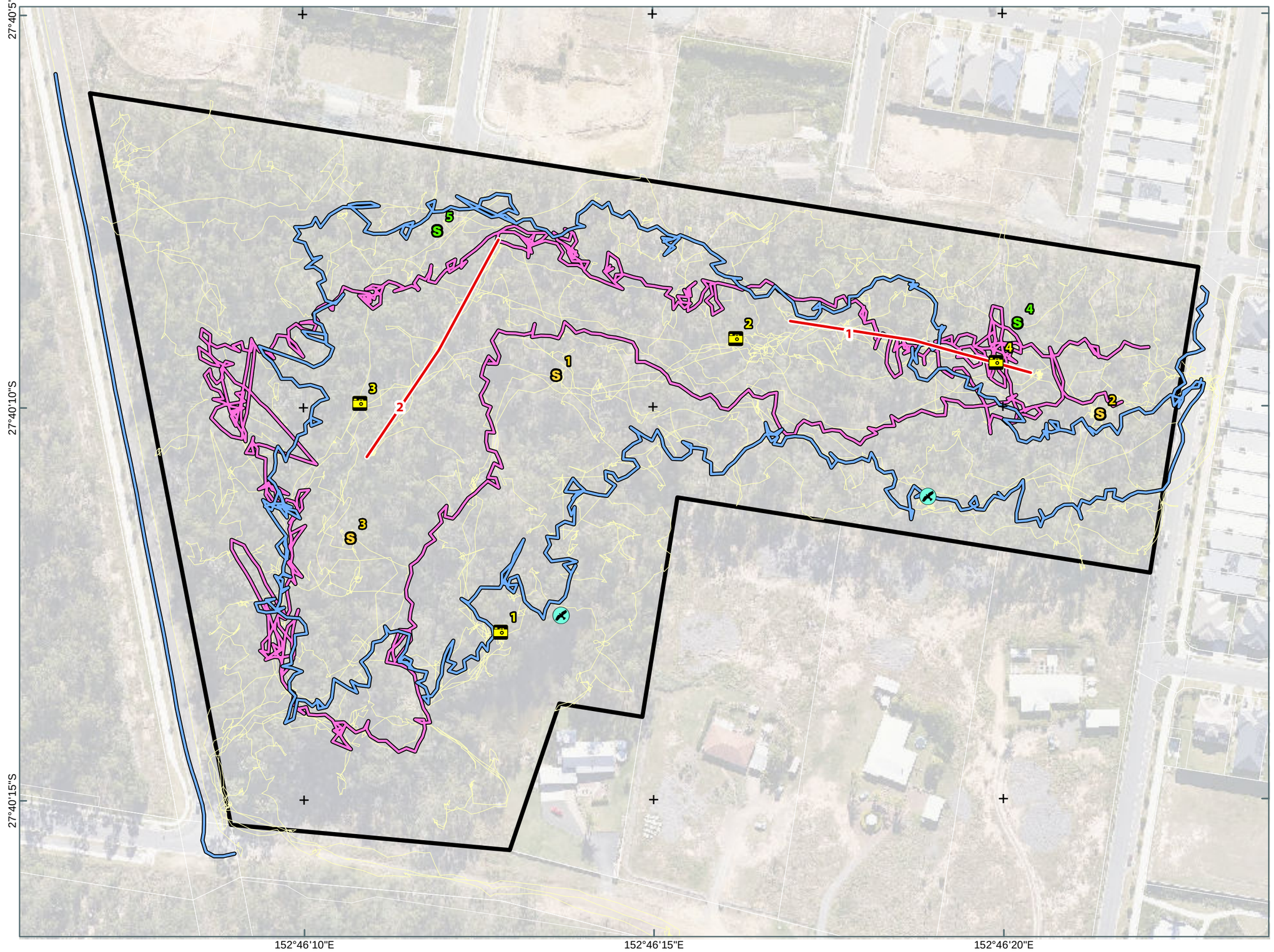
BINNIES ROAD, RIPLEY

0 2 4 km
Transverse Mercator
GDA 2020 | Zone 56

N
1:180,000
@ A3

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11826 E A13 YBG Records A

A14. FIELD SURVEY EFFORT



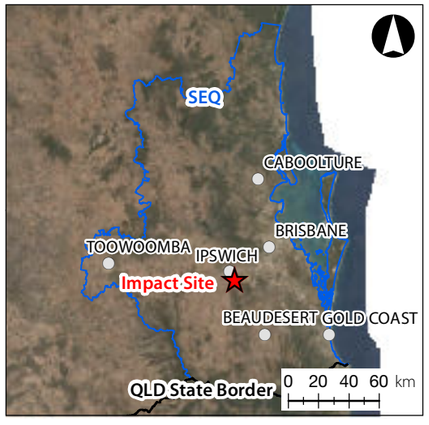
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LEGEND

- Qld DCDB
- Referral Area
- Spotlighting Track (2024/02/14)
- Spotlighting Track (2024/02/15)
- MHQA Transect
- Incidental Surveys
- Koala SAT Survey (2024/02/01)
- Koala SAT Survey (2024/08/12)
- Bird survey
- Camera trap



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BINNIES ROAD, RIPLEY

0 20 40 m
Transverse Mercator
GDA 2020 | Zone 56

N
1:1,500 @ A3

Address / RPD: *Lot 335 on RP814578*

10/07/2025

11826 E A14 Field Survey A

A15. FIELD RESULTS

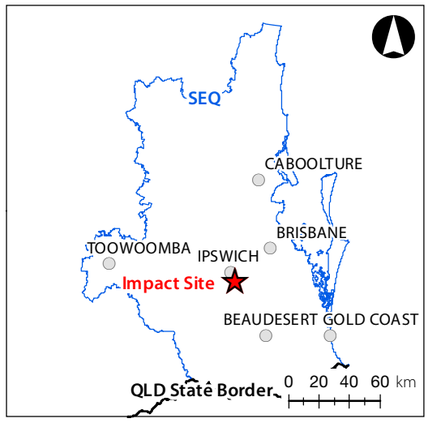


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LEGEND

- Qld DCDB
- Referral Area
- Native tree >=380mm DBH
- Stag/dead tree >380mm DBH
- Medium sized hollows (100-299mm)
- Large sized hollows (≥300mm)



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BINNIES ROAD, RIPLEY

0 20 40 m
Transverse Mercator
GDA 2020 | Zone 56

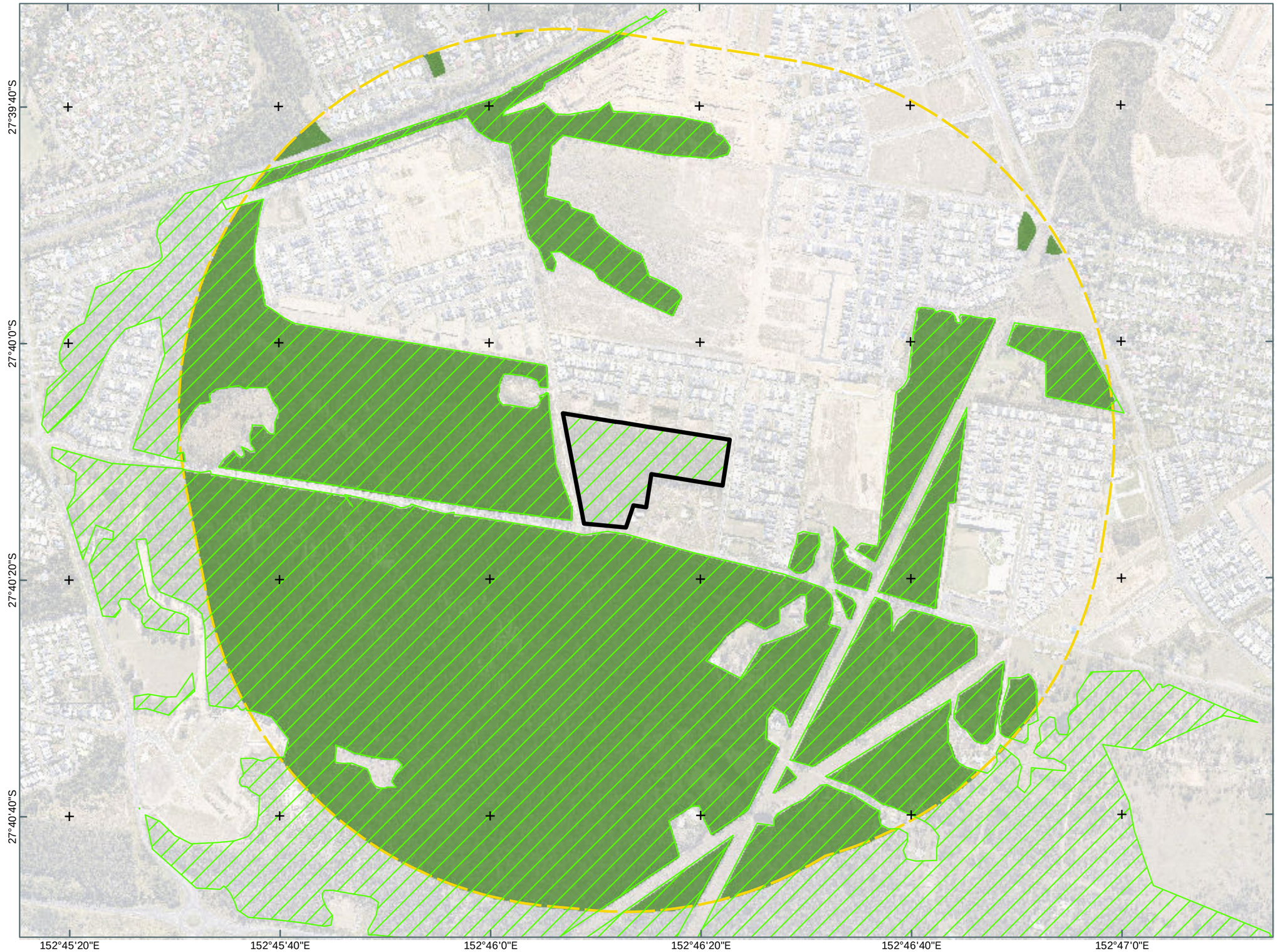
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1:1,500
@ A3

Address / RPD: *Lot 335 on RP814578*

16/12/2025

11826 E A15 Field Results A

A16. KOALA CONTEXT



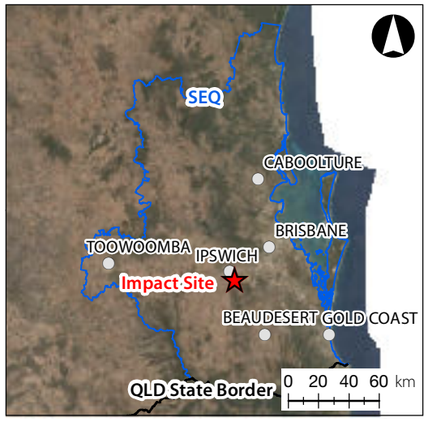
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LEGEND

- Qld DCDB
- Referral Area
- 1km buffer
- Percentage of impact area boundary length supporting a koala critical habitat connection off and on site - 0%
- Size of Koala critical habitat patch adjoining impact site - >500ha
- Percentage of Koala Critical habitat within 1km of impact site (49.8%)



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BINNIES ROAD, RIPLEY

0 100 200 m

Transverse Mercator
GDA 2020 | Zone 56

N

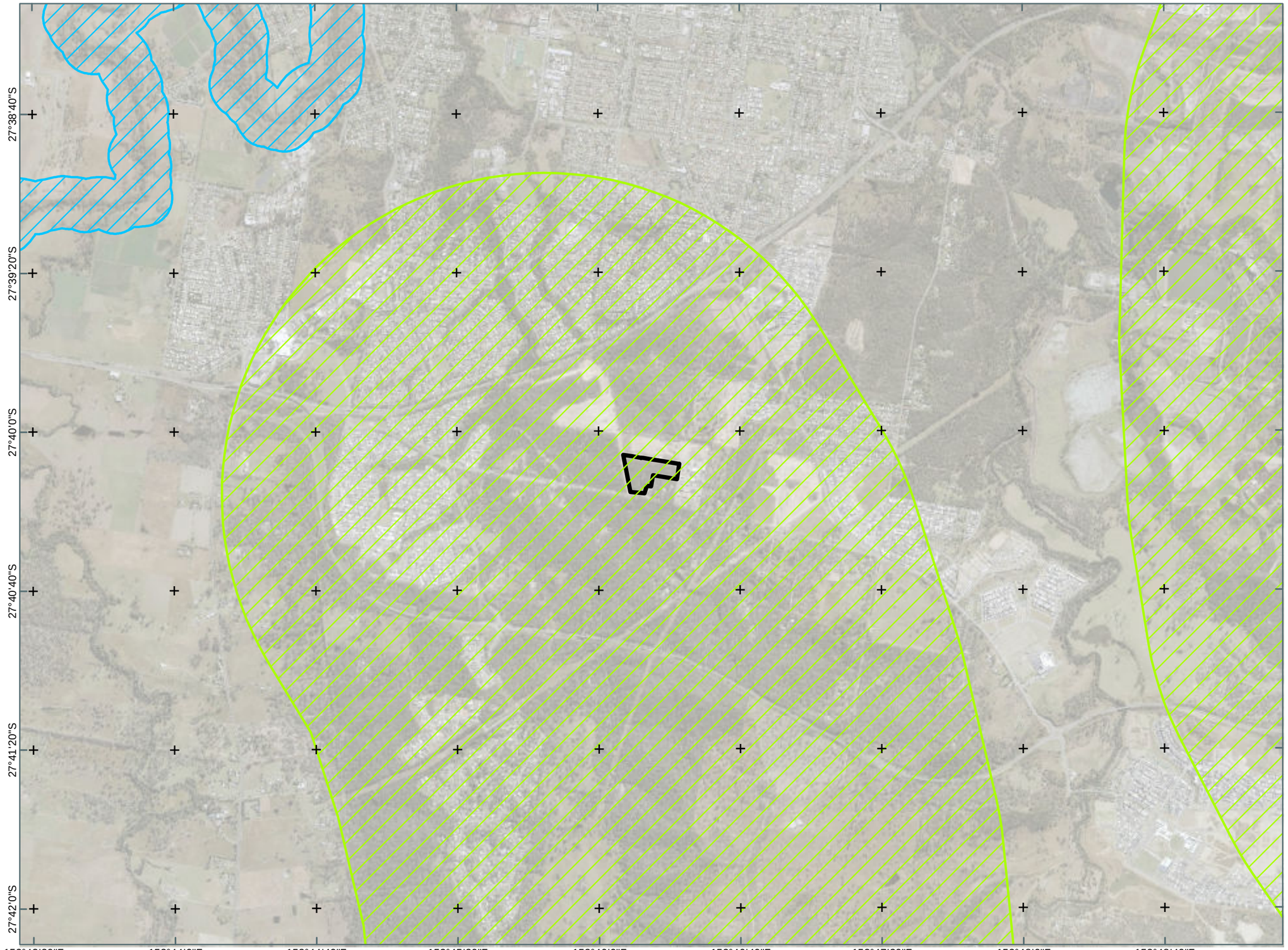
1:10,000
@ A3

Address / RPD: *Lot 335 on RP814578*

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11826 E A16 Koala Context A_

A17. ECOLOGICAL CORRIDORS



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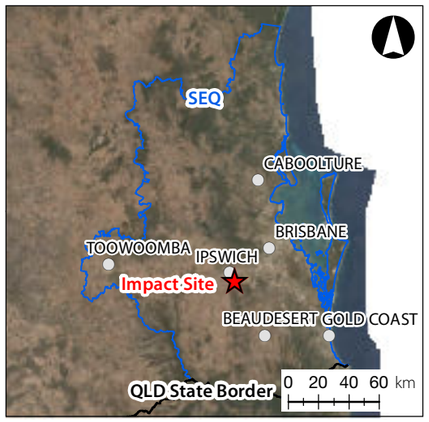
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LEGEND

- Qld DCDB
- Referral Area

Statewide Corridors

- Regional Significance
- State Significance



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BINNIES ROAD, RIPLEY

0 300 600 m

Transverse Mercator
GDA 2020 | Zone 56

N

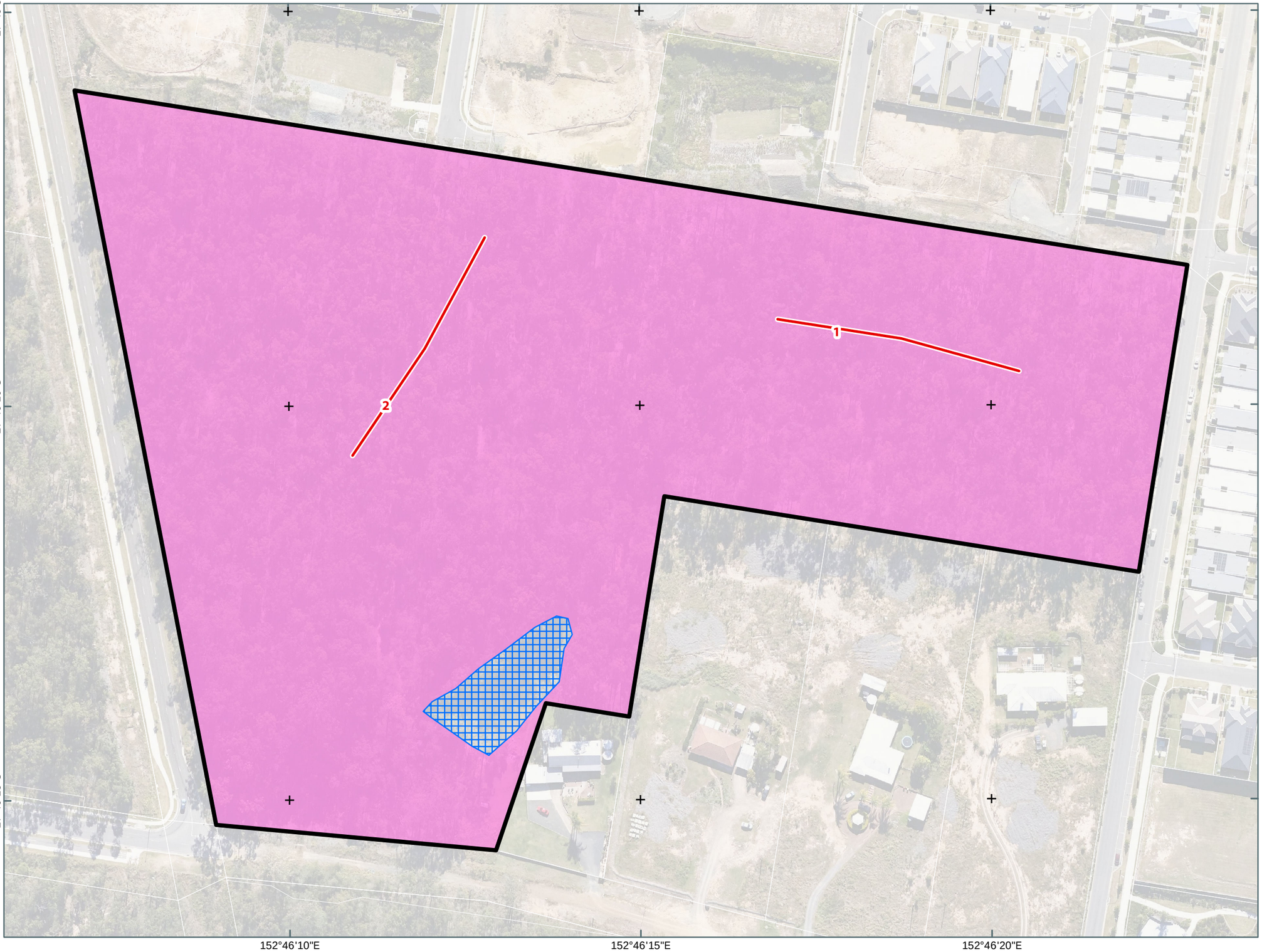
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Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A17 Eco Corridors A_

A18. KOALA AND GREY-HEADED FLYING-FOX HABITAT IMPACT



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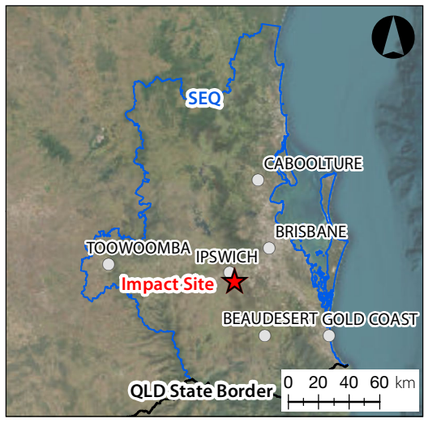
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LEGEND

- Qld DCDB
- Referral Area
- Constructed Dam [0.14 ha]
- Impacted Koala and Grey-headed Flying-fox Habitat [7.38 ha]
- MHQA Transect



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BINNIES ROAD, RIPLEY

0 20 40 m

Transverse Mercator
GDA 2020 | Zone 56

N

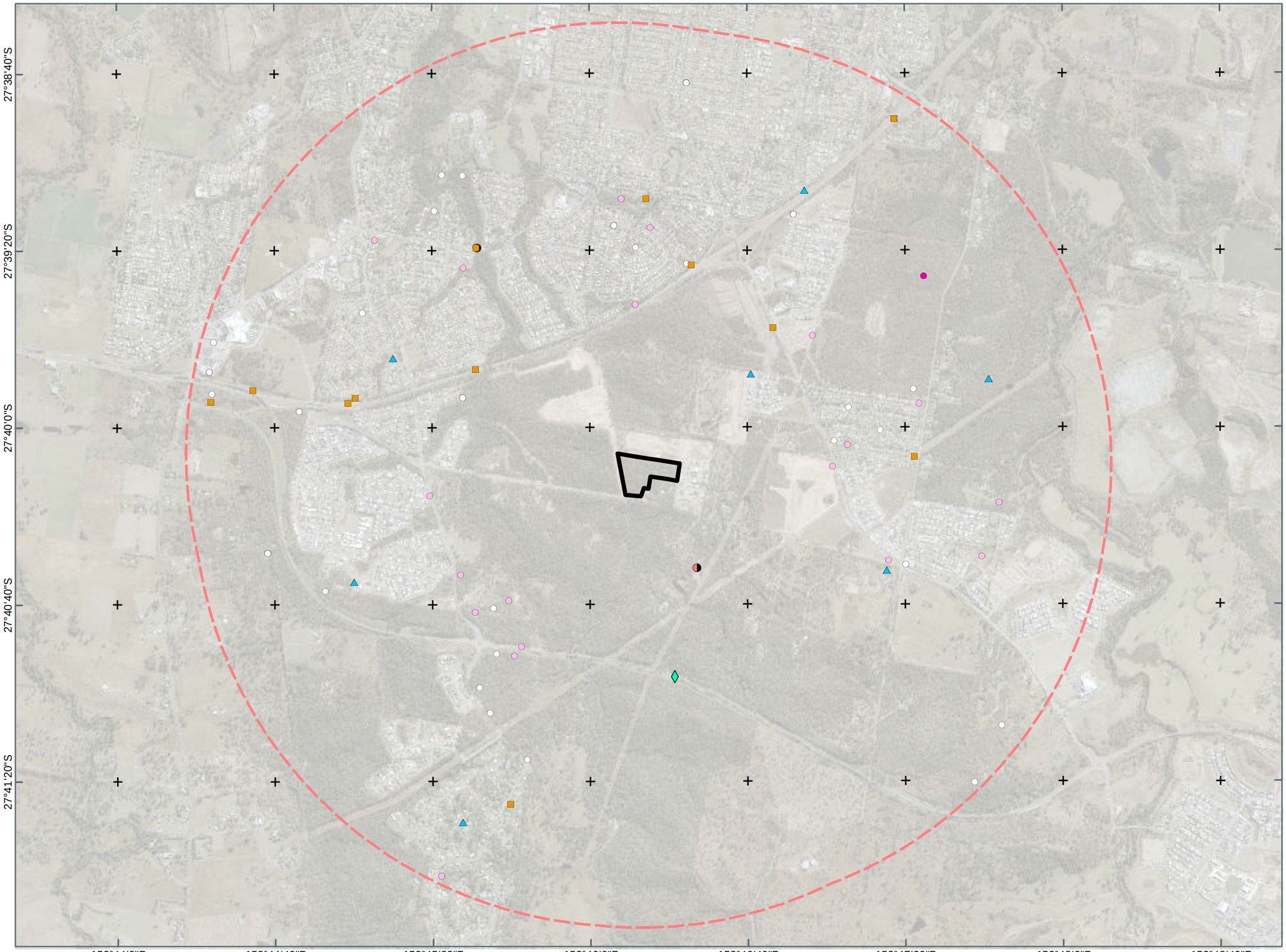
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Address / RPD: *Lot 335 on RP814578*

17/02/2026

11826 E A18 Koala Impact B

A19. KOALA HOSPITAL RECORDS



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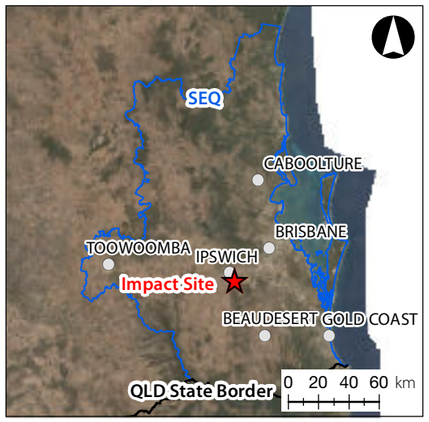
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LEGEND

- Qld DCDB
- Referral Area
- Referral Area 3km Buffer

Qld Koala Hospital Records

- Deceased [13]
- Injured [7]
- Sick and/or wasted [19]
- Sick & Injured [1]
- Orphaned [2]
- Vehicle hit [1]
- Other incident type/ category not recorded [38]



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BINNIES ROAD, RIPLEY

0 300 600 m
Transverse Mercator
GDA 2020 | Zone 56

N
1:27,000 @ A3

Address / RPD: *Lot 335 on RP814578*

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11826 E A19 Koala Hospital A_

A20. HOLLOW BEARING TREES



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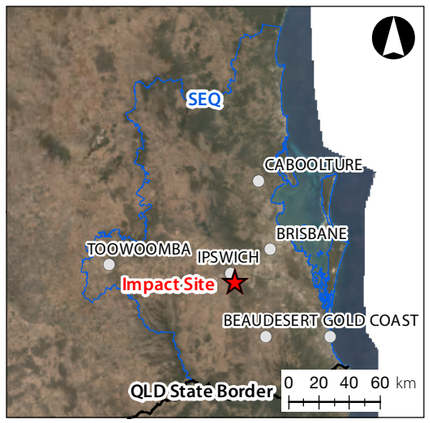
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LEGEND

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- Referral Area [7.5 ha]
- Medium sized hollows (100-299mm)
- Large sized hollows (≥300mm)



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BINNIES ROAD, RIPLEY

0 20 40 m

Transverse Mercator
GDA 2020 | Zone 56

N

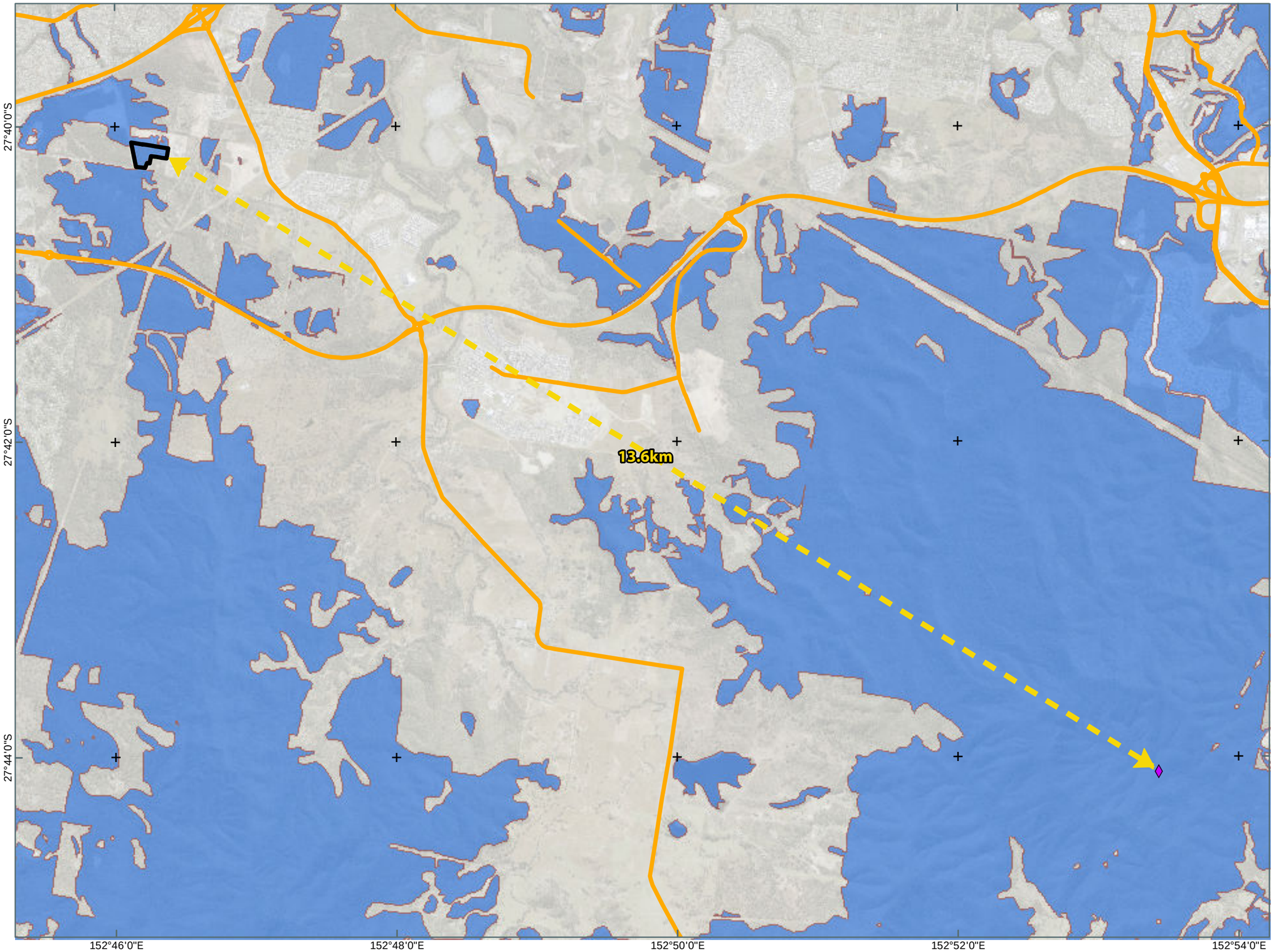
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Address / RPD: *Lot 335 on RP814578*

16/12/2025

11826 E A20 GG Impact A

A21. GREATER GLIDER RECORD DISTANCE

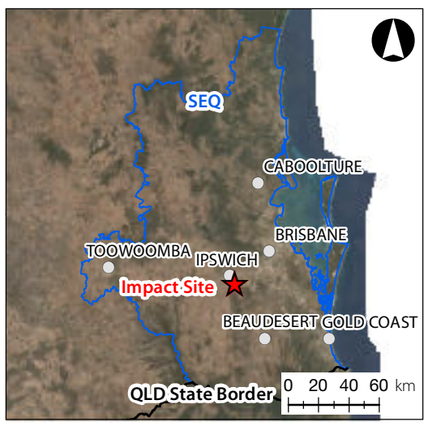


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LEGEND

- Referral Area
- Category B area - *Remnant vegetation*
- Measurement
- Major Road
- Southern Greater Glider Records within the last 20 years (ALA, 2025)



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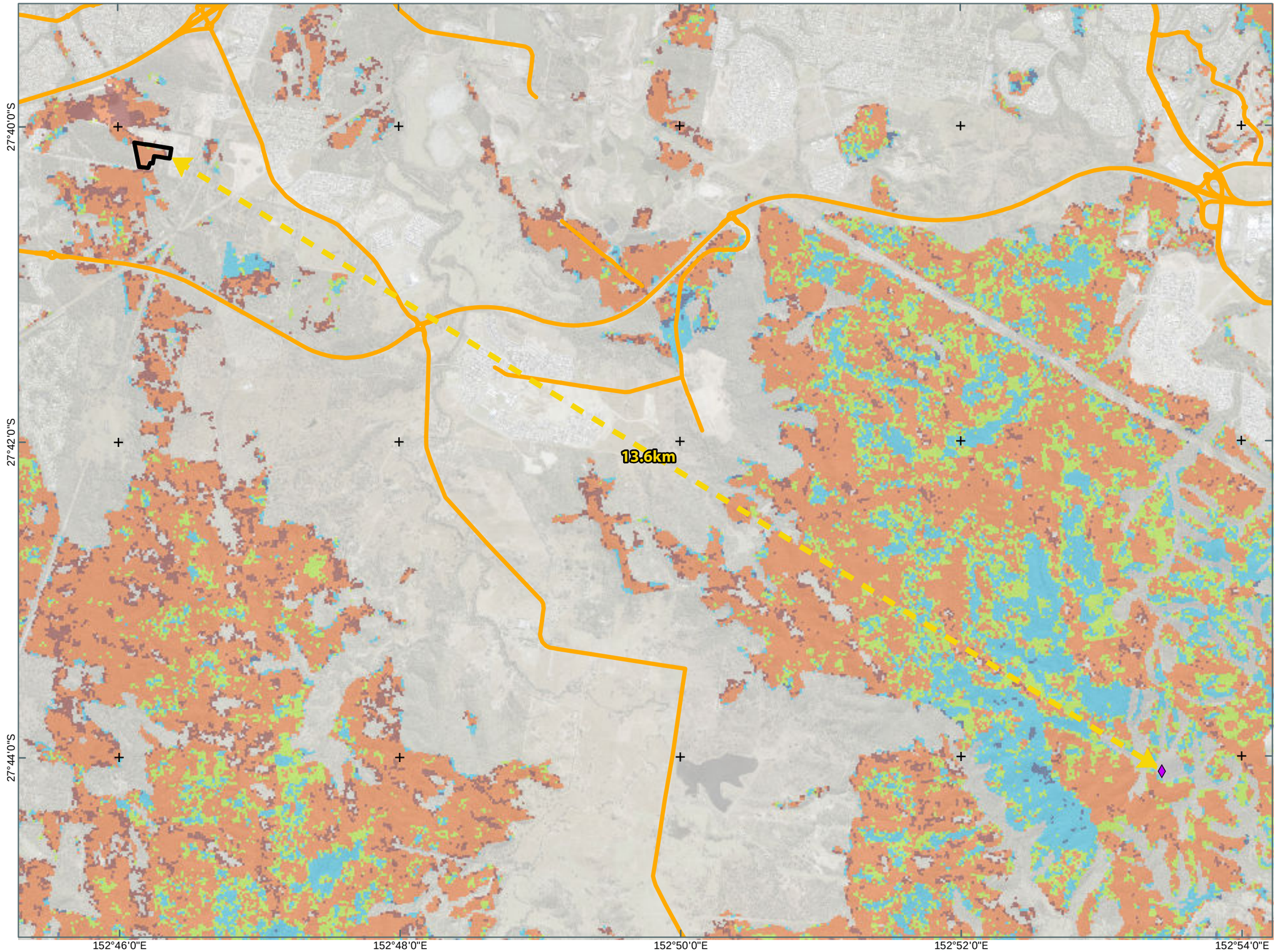
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A22. FOREST MATURITY TYPE MAP (GRIFFITH UNIVERSITY)



Notes:
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Layer Sources

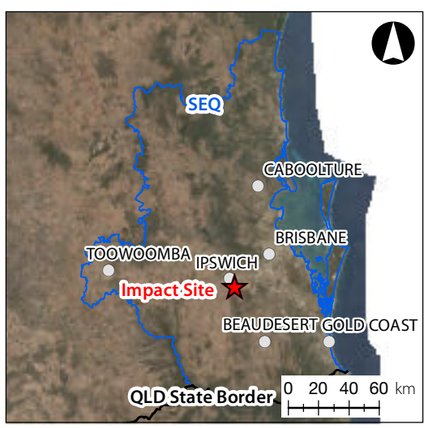
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LEGEND

- Referral Area

Forest Maturity

- Mature Vegetation
- *(Intermediate to Mature Aged Vegetation)*
- Intermediate Aged Vegetation
- *(Young to Intermediate Aged Vegetation)*
- Young Vegetation
- Measurement
- Major Road
- Southern Greater Glider Records within the last 20 years (ALA, 2025)



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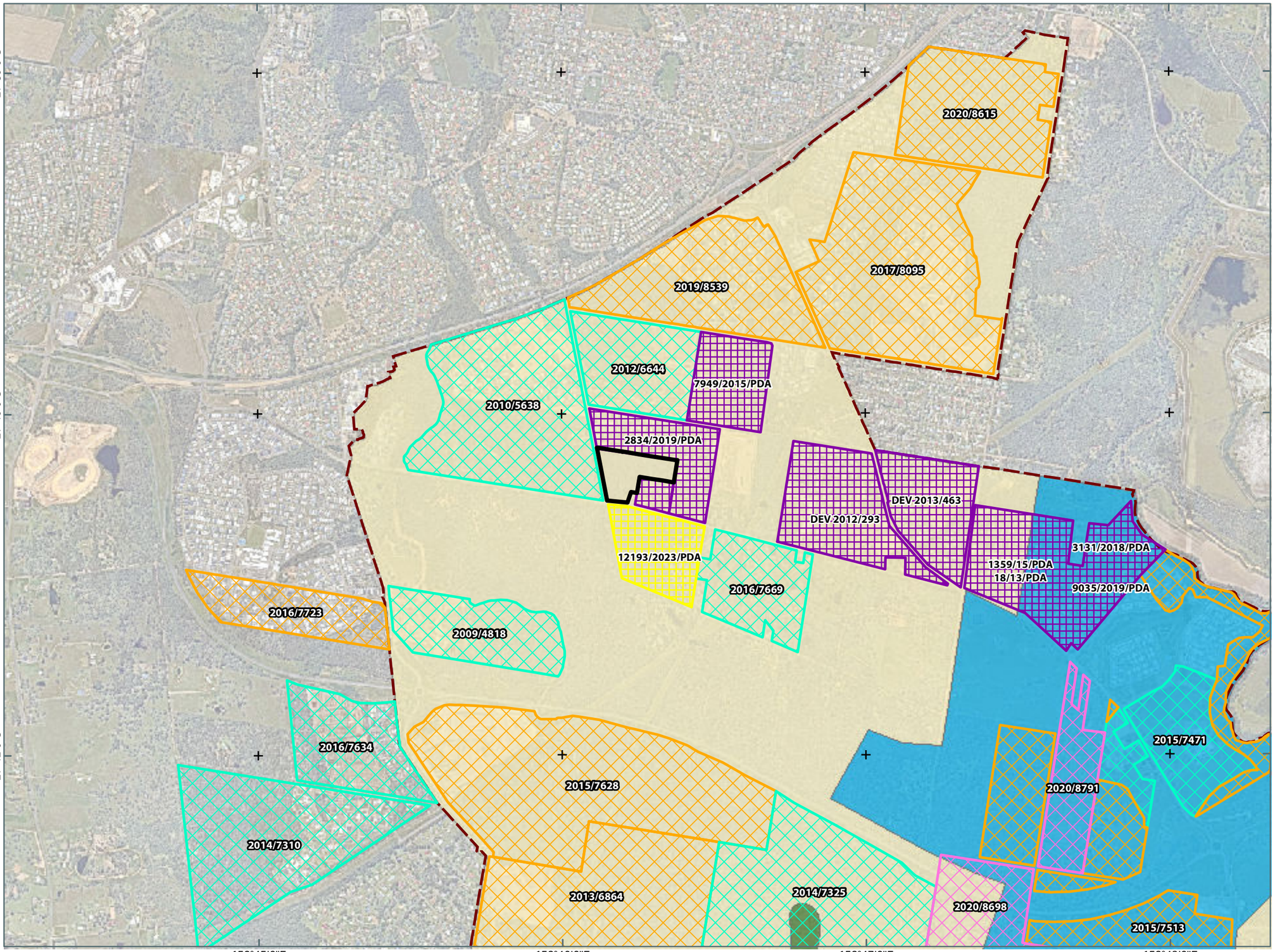
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A23. ZONING AND APPROVALS



Notes:
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Layer Sources

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LEGEND

- Referral Area
- Ripley Valley PDA Boundary

PDA Zoning

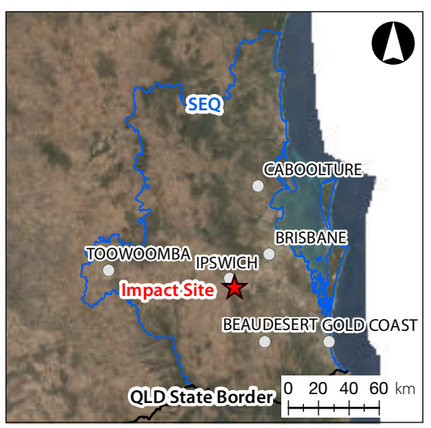
- Urban Core
- Urban Living
- Environmental Protection

EDQ DA Descisons

- Approved Sites
- Application Sites

EPBC Referral Descisions

- Under Assessment
- Not a Controlled Action
- Approved



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13. Attachments

Attachment A1

EPBC Act Controlled Action Decision Notice and PD RFI

Attachment A2

Plan of Development

Attachment A3

Impact MHQA Data Sheets

Attachment A4

Raw SAT Data

Attachment A5

Offset Management Plan

Attachment A1

EPBC Act Controlled Action Decision Notice and PD RFI

Australian Government
Department of Climate Change, Energy, the Environment and Water

Notification of referral decision and designated proponent – controlled action – and assessment approach

Ripley Residential Development Project, Ripley, QLD (EPBC 2024/09865)

This decision is made under section 75 and section 87 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed Action

designated proponent	HB QLD Pty Ltd ABN: 26 638 077 415
proposed Action	Construction of a residential development, including residential dwellings, pathways, and associated roads and other infrastructure, at 187-197 Binnies Road in Ripley, Queensland (see EPBC Act referral 2024/09865).

Referral decision: controlled action

status of proposed Action	The proposed action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
relevant controlling provisions	• Listed threatened species and communities (sections 18 and 18A)

Assessment approach decision

assessment approach	The proposed action will be assessed by preliminary documentation

Person authorised to make decision

name and position	Mark Say Acting Branch Head Environment Assessments Queensland Branch
signature	
date of decision	5 July 2024

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC ref: 2024/09865

Peter Johnson
National Development Director
HB QLD Pty Ltd
Suite 323, Oracle South, 17 Elizabeth Avenue
BROADBEACH QLD 4218

pj@hbland.com.au

Further information required for preliminary documentation for Ripley Residential Development Project, Ripley, QLD (EPBC 2024/09865)

Dear Mr Johnson,

I am writing to you about your proposal to construct a residential development, including residential dwellings, pathways, and associated roads and other infrastructure, in Ripley, Queensland.

On 5 July 2024, a delegate of the Minister for the Environment and Water decided that the proposed action is a controlled action and that it will be assessed by preliminary documentation. Further information was required to assess the relevant impacts of the proposed action.

I now request, under s95A(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), further information as outlined in the attached.

Details on the assessment process for the project and the responsibilities of the proponent are set out in the EPBC Act — Environment Assessment process fact sheet. Further information on the referral and assessment process can be found on the department's website.

If you have any questions about the assessment process or the further information required, please contact the project manager, Roxanne Bowers, by email to Roxanne.Bowers@dcceew.gov.au and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Tyrie Starrs
Director
Queensland South Assessments Section
23 July 2024

ATTACHMENT A
REQUEST FOR ADDITIONAL INFORMATION REQUIRED FOR ASSESSMENT BY PRELIMINARY DOCUMENTATION

Ripley Residential Development Project, 187-197 Binnies Road, Ripley, QLD (EPBC 2024/09865)

Under s95A(2) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), further information is required to inform the assessment of impacts of this action, including information about strategies for avoiding and mitigating any adverse impacts.

The preliminary documentation for the proposal must include:

a) specified information included in the original referral.

b) additional information you provide in response to this request.

c) any other information specified in this request or provided during the referral or assessment process.

Please note the department may require further information, in addition to the information required below, should new issues come to light during the assessment stage.

The preliminary documentation must address the matters set out below.

1. General content, format and style

The preliminary documentation must be written so that any conclusions reached can be independently assessed, and:	
1.1.	Include a reference table indicating where to find information and links within the document to relevant sections. Where relevant information was provided in the referral, please incorporate, or cross-reference to this information as necessary in the preliminary documentation.
1.2.	Contain sufficient information to allow the Minister (or delegate) to make an informed decision on whether to approve, under Part 9 of the EPBC Act, the taking of the action for the purposes of each controlling provision. Contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed development on matters of national environmental significance (MNES).
1.3.	Ensure all work and conclusions: a) are presented clearly, unambiguously, succinctly and objectively. b) are evidence based, and the evidence is provided. c) are supported by peer reviewed literature, with references provided, or expert opinion. d) use scientifically robust methodologies appropriate to the purpose, including a justification of why the methodology/s was selected; details of the methodology described in a manner that allows an independent suitably qualified

	practitioners to apply the method; and, state any limitations of the chosen approach. e) are supported by maps, plans, diagrams, baseline surveys or other descriptive detail. f) maps must clearly identify development footprints, buffer zones, and any conservation areas where impacts will be avoided, and areas of adjacent habitat that would be subject to indirect impacts, including areas that are to be retained within and adjacent to the site. g) use active language and state clear commitments (e.g., 'must' and 'will') where appropriate, particularly in describing avoidance, mitigation and management actions and outcomes. h) demonstrate the use of the most up to date statutory documents* including Approved Listing Advice(s), Conservation Advice(s), Recovery Plan(s), Threat Abatement Plan(s) or comparable policy guidelines, and approved survey methods. i) demonstrate the use of up-to-date; policy guidelines, scientific methods, information, data and species-relevant survey methods. j) appropriately reference all sources using the Harvard standard. The reference list must include the address of any internet pages used as data sources. **relevant documents include, but are not limited to, the resources found in the Species Profile and Threats Database (SPRAT database) and EPBC Act publications and resources*.
1.4.	Be able to read as a stand-alone document and must include summaries of all relevant information referenced or provided in appendices. Complex or detailed technical information, studies or investigations necessary to support the main text should be attached to the main document as appendices.

2. Description of the action

The preliminary documentation must include:	
2.1.	a) A description of all components of the proposed action (such as pre-construction, construction and operational), including the staging, sequencing, duration and timing. b) A description of the anticipated start and completion dates of all actions such as the extent, staging and timing of clearing undertaken over the construction period. c) The location, extent, and size (in hectares) of the total project footprint, disturbance/impact footprint, and of any adjoining areas (beyond the impact area) that may be subject to indirect or facilitated impacts, including edge effects, noise or light spill, vehicle access or other associated activities. d) A description, with supporting spatial information, detailing all site access

	roads and any other shared infrastructure with adjacent projects/areas to be constructed to facilitate the proposed action. *Please describe any changes to project or disturbance footprints that may have occurred since the original referral. Please note these changes may require a formal variation request.*
2.2.	Provide a description of the intended land uses proposed as part of the completed development, including of any proposed open space and/or conservation areas and associated ongoing activities, and details of the intended party that would be responsible for future management activities.
2.3.	Details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies or is likely to apply to the proposed action. Details should include (but are not limited to): a) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy? b) application/approval numbers for existing applications where relevant c) obtained approvals or additional approvals that are required.

3. Description of the environment and Matters of National Environmental Significance

Description of the environment The preliminary documentation must provide a description of the environment affected by and surrounding the proposed action area, over both the short and long term, including:	
3.1.	A description of the environment more broadly including previous and current land use within and surrounding the proposed action area.
3.2.	A description of any potential listed threatened species or ecological community (including but not limited to those listed in this request for information) that occur in the project area and adjacent areas. *Please ensure that a recent Protected Matters Search Tool report is generated and used during the assessment before finalising the draft preliminary documentation to identify any additional species (listed at the time of the controlled action area) that may be affected by the proposal.*
3.3.	For listed threatened species and ecological communities that have the potential, or are likely, to be present at and in the vicinity of the project site, including but not limited to those listed in this request, please provide a likelihood of occurrence assessment including the following: a) Information on the abundance, distribution, ecology and habitat preference of the species or communities. b) Quantification of the extent of habitat (including maps identifying known or

	potential habitat) on site and, where feasible, in the broader landscape. c) Quality and importance of known or potential habitat for the species or communities. d) Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations. e) Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site. *Likelihood or occurrence and habitat assessments must be informed by up-to-date desktop and field surveys and informed by relevant departmental documents (e.g., approved Conservation Advice, Recovery Plans, draft referral guidelines and Listing Advice, and SPRAT Database) and/or species experts.*
3.4.	Up to date baseline and survey data at the impact site(s), and if relevant, the proposed offset site(s) site, including: a) Information on the survey methodology or technique used (e.g., thermal detection, camera trapping, tree hollow search, SAT surveys etc) b) When surveys were conducted (e.g., dates, time of day, season, etc.) and survey effort (e.g., two hours for every one hectare within a 5-hectare area) c) Map/s of survey points or transects and how the survey points or transects were selected. d) An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. e) Results of all surveys undertaken.
3.5.	Based on survey data and with reference to relevant statutory documents, provide a clear description of the total extent and quality of habitat present within and surrounding the proposed action area for each species or ecological community potentially present or impacted by the action. For all species with residual significant impacts the method used to quantitatively assess the quality of habitat must be discussed and endorsed by the department before being applied.

Survey requirements

Survey timing

Please note that some surveys can take more than a year to complete to ensure they are undertaken in the correct season. The department generally cannot accept survey data that's more than 5 years old because:

- populations of species can change due to fires, drought, flooding and land management changes.
- some species' ranges can shift due to climate change.

If your data is older than 4 years when you start planning your project, the department recommends you undertake further up to date surveys.

For information on survey methodologies approved by the Australian Government, please refer to https://www.dcceew.gov.au/environment/epbc/advice/surveys-and-data

Precautionary principle

Failing to survey appropriately for threatened species that may be present at a site could result in the department applying the precautionary principle with regard to residual significant impact determinations.

That is, if no supporting evidence (such as survey results) is presented to support the claim of species absence, then the department may assume that the species is in fact present. The department will not accept claimed species absence without effective validation such as through application of survey guidelines, other survey techniques (for example, a state guideline or an accepted industry guideline), or statements from relevant species experts. Where a claim of absence is made, proposals must provide a robust evaluation of species absence.

4. Impact assessment

Based on the information provided in the referral, additional information provided in support of the referral, information provided in the SPRAT database, and online observation records, the department considers the proposed action is likely to have a significant impact on the following controlling provision:

- Listed threatened species and communities (sections 18 and 18A)

Based on the information available in the referral, the proposed action is likely to have a significant impact on the following matters of national environmental significance, including but not limited to:

Koala (*Phascolarctos cinereus* (Combined populations QLD, NSW, and the ACT)) – endangered

- The proposed action will result in the loss of 7.38 ha of habitat critical to the survival of the Koala.

Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable

- The proposed action will result in the loss of 7.38 ha of habitat critical to the survival of the Grey-headed Flying-fox.

Based on all the information available to the department (including the PMST, which suggests the

presence of the following species or communities in the area of the proposal), and without further detailed assessment of potential impacts, the department considers that the proposed action may significantly impact on other listed threatened species including but not limited to the following:

South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) – vulnerable

Referral documentation states that the desktop likelihood of occurrence is moderate, but the confirmed likelihood of occurrence is low, predominantly due to lack of available habitat on-site. The department believes that habitat, including both foraging and breeding habitat has not been adequately discussed in accordance with the South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) Conservation Advice. This includes, but is not limited to, a more in-depth description of survey methodology used to categorise large trees or locate hollows. More information is also required on how hollows have been categorised, in accordance with the Conservation Advice for the species. Further information, including the Conservation Advice and other relevant information, can be found on the Species Profile and Threats Database.

Swift Parrot (*Lathamus discolor*) - critically endangered

Referral documentation confirms suitable habitat on-site, with a preferred species – Spotted Gum (*Corymbia citriodora*) – being the dominant canopy species. The referral documentation states that there are no records of the species in the area, however, the species has been recorded on the Atlas of Living Australia (ALA) less than 10 km from the site. The desktop likelihood of occurrence was moderate, but the confirmed likelihood of occurrence is low, due to failure to observe species on-site during surveys and the limited presence of hollow-bearing trees. The department notes that failure to locate the species during surveys does not conclude that the species is not present or that habitat critical to the survival of the species is absent. Survey methods of habitat on-site needs to be documented and habitat adequately characterised and discussed in accordance with the Swift Parrot (*Lathamus discolor*) Conservation Advice and the National Recovery Plan for the Swift Parrot (*Lathamus discolor*). These documents and other information can be found on the Species Profile and Threats Database.

Regent Honeyeater (*Anthochaera phrygia*) - critically endangered

The likelihood of occurrence is listed as moderate, suitable foraging habitat is present on site, and there is an ALA record of the species less than 5 km from the site. As such, the department believes that habitat critical to the survival of the species has not been adequately discussed in order to determine the likelihood of a significant impact. Survey methods of habitat on site needs to be documented and habitat adequately characterised and discussed in accordance with the "Conservation Advice *Anthochaera phrygia* Regent Honeyeater" and the "National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*)". These documents and other relevant information can be found on the Species Profile and Threats Database.

Greater Glider (*Petauroides volans*) - endangered

Habitat for the species on site must be characterised in accordance with the Conservation Advice for *Petauroides volans* (Greater Glider (southern and central). The quantification of 1.46 ha of habitat on site incorporating a 100m buffer needs further detail and justification. including justification of why the remaining habitat on site is not considered suitable. Methods of surveying, characterising, and discussing habitat must be undertaken in accordance with the Conservation Advice for *Petauroides volans* (Greater Glider (southern and central)). This document and other information

can be found on the Species Profile and Threats Database.

South-eastern Yellow-bellied Glider (*Petaurus australis australis*) - vulnerable

The likelihood of occurrence for this species was initially listed as moderate but was determined as low due to the low number of hollow-bearing trees and lack of occurrence records nearby. However, there is an ALA record less than 6.5 km away and the survey methods and categorisation of hollows and hollow-bearing trees on site has not been adequately discussed. Foraging habitat for the species has also not been adequately discussed. Habitat characterisation must align with information in the Conservation Advice for *Petaurus australis australis* (Yellow-bellied Glider (south-eastern)). This and other information can be found on the Species Profile and Threats Database.

Note that this may not be a complete list and it is your responsibility, as the proponent, to ensure that any species or ecological communities listed under the EPBC Act at the time of the controlled action decision, which may be present or potentially significantly impacted, are assessed as part of the preliminary documentation.

The preliminary documentation must include an up-to-date assessment of potential impacts that may occur as a result of the proposed action. Consideration of impacts must not be confined to the immediate area of the proposed action but must also consider the potential of the proposed action to impact on adjacent areas that are likely to contain populations and/or habitat for MNES.	
4.1.	Include a clear description of the total extent and quality of the following: a) project footprint (including the total extent of habitat present for each relevant protected matter) b) direct and indirect impact areas (including the total extent of habitat for each relevant protected matter to be impacted) a) total areas proposed to be retained/avoided (including the total extent of habitat present for each relevant protected matter to be avoided).
4.2.	To inform point 4.1, please provide an assessment of the direct, indirect, facilitated and cumulative impacts that may occur as a result of the proposed action at a local and regional scale. The assessment should include consideration of: a) the nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable or irreversible. b) timing and whether the impact is temporary or permanent c) species specific habitat requirements such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable). d) whether connectivity and movement opportunities in the surrounding area may be retained, removed or functionally lost or compromised.

	e) adjacent areas of habitat that may or will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence) f) indirect or facilitated impacts that may result from the proposed action, including but not limited to the following: i. Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment. ii. Vehicle movement – potential increase of vehicles to strike fauna in the pre-construction, construction, and operation phase of the project. iii. Increased presence of dogs – pre-construction, construction and operation phases have the potential to increase dog presence in the referral area and adjacent environment. iv. Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil in the pre-construction and construction phase of the project. v. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during construction and operation of the residential development. g) cumulative impacts, where potential project impacts on MNES are in addition to existing impacts of other activities (including current or future developments by the proponent and other proponents in the region and vicinity)
Note:	Please review the following policy statement, providing guidance on what impacts constitute a 'indirect consequences(s)', under paragraph 527E(1)(b) of the EPBC Act. Facilitated impacts may include (but are not limited to) the risk of injury or mortality to MNES as a result of the introduction of domestic dogs in a residential area, vehicle strike as a result of increased residential car use and/or the development of swimming pools.
4.3.	Include current maps and coordinates/shapefiles showing the total project footprint, total disturbance/direct and indirect impact areas, areas of habitat for MNES proposed to be retained.
4.4.	Include details of any policy guidelines, relevant studies, surveys, or consultations with species experts/field specialists, which were not included in the referral or additional information provided in support of the referral.

5. Avoidance, mitigation and management measures

The information available in the referral indicates that there is substantial area within the project footprint with protected matters present or likely to be present.

The mitigation hierarchy is a process that is used to limit the amount of damage an action, such as a development, will have on the environment. There are three steps, and each step must be followed in order and to the greatest extent possible before moving on to the next. These steps are:

1. **avoid** harm to the environment within and surrounding the project area.
2. **reduce** or mitigate environmental damage within and surrounding the project area.
3. identify **offsets** within the region that compensate for the significant residual impacts to listed species or ecological communities.

The preliminary documentation must provide information on proposed avoidance, safeguards and mitigation measures to deal with the relevant impacts of the proposed action on MNES.

5.1.	Demonstrate that you have applied the mitigation hierarchy and exhausted all options to avoid and mitigate harm to protected matters, before resorting to environmental offsets. In doing this, you must demonstrate that any avoidance or mitigation measures will provide ecological benefits to the species in the long-term. For example, on-site avoidance/conservation areas must be connected or provide connectivity opportunities for species in the broader landscape, and must include enduring mitigation of impacts from adjacent development.
5.2.	Provide details (including a summary list or table) of avoidance and mitigation measures proposed to be undertaken to prevent or minimise impacts on protected matters (or their habitat) from the proposed action area, including: a) a description of avoidance measures that have been considered and applied. For example, project site selection to avoid valuable habitat, micro-siting of infrastructure to avoid impacts on habitat on site, or avoidance of any activity that may indirectly impact on essential lifecycle processes for species. b) a description of proposed safeguards and mitigation measures to minimise and manage relevant impacts of the action, with reference to relevant statutory or policy documents at the Commonwealth and State level (e.g., *Guideline: State Development Assessment Provisions (State Code 25)*) c) pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease. d) measures to address the risk of species, such as the koala, entering the residential area and becoming trapped/isolated without resources for shelter whilst in the residential area and safe movement opportunities to get out of the residential area, along with sufficient information on the location and design of these measures. e) ongoing management of direct and indirect impacts due to increased likelihood of

	human presence, attacks by domestic dogs, and injury caused by negotiating various fence types. f) details of how speed reduction is to be achieved (e.g., traffic calming devices) and plans showing the locations of each of these features and the manner in which they will be implemented). g) information on safe road design and placement, including installation of crossing warning signs, wildlife threshold marking on road (include maps and imagery). h) the locations and size of any proposed fauna movement solutions, fire breaks, no-go or buffer zones (including buffers between the construction footprint or remaining habitat in the referral area and adjacent to the site), and potential fencing, including: i. the location of any movement solutions, fire breaks, buffer zones, or fencing. ii. the characteristics of the fauna movement solutions, fire breaks, buffer zones and fencing, (i.e., height, length, wildlife proof measures etc) iii. whether the proposed measures, such as fencing will provide a wildlife barrier to/from/within the proposed action area. i) a description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes. j) information on the timing, frequency, and duration of the measures to be implemented. k) an actual or estimated cost of the mitigation measures.
5.3.	Provide an assessment of the predicted effectiveness of each proposed avoidance or mitigation measure, noting that the effectiveness of a particular measure is a reflection of confidence in the anticipated outcome. The assessment of effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome.
5.4.	For each measure proposed, indicate the: a) impacts that are being avoided and/or the significance of impacts being reduced through mitigation. b) Scientific basis for conclusions being drawn c) an evidence-based likelihood of success/risk assessment d) responsible party e) milestones / performance / completion criteria f) proposed monitoring and evaluation program.
5.5.	Describe any statutory or policy basis for the proposed measures, including reference to

	the SPRAT Database and relevant approved conservation advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans. For example, the National Recovery Plan for the Grey-Headed Flying Fox states an objective to: '*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'.* Please provide a discussion on how the proposed action is not inconsistent with relevant species' objectives or alternatively, how the proposed avoidance, mitigation/management and offsetting actions will compensate for any residual significant impacts, thereby ensuring consistency with the objective for relevant EPBC Act species.
5.6.	All proposed measures must consider the 'S.M.A.R.T' principle: S – Specific (protected matter-specific objectives, methods, outcomes, and repeatability) M – Measurable (baseline information, quantifiable, auditable) A – Achievable (timeframes, financial and human resources) R – Relevant (conservation advice, recovery plans, threat abatement plans) T – Time-bound (set implementation, performance and completion timeframes).

6. Proposed offsets

Where residual significant impacts to listed threatened species or ecological communities remain after application of all reasonable avoidance and mitigation measures, a compensatory environmental offset in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (EPBC Offsets Policy)[1] is required.

Offsets must be specific to the species or ecological community being impacted, must address the attribute of the protected matter that is impacted, and must deliver an outcome for the protected matter that is demonstrably equal or better than if neither the impact nor the offset occurred. Offsets are not intended to make proposed actions with unacceptable impacts, acceptable.

If an offset is required, prior to publication, the preliminary documentation must include an:

1. **Offset Proposal** – The Offset Proposal must provide detail about the proposed offset site or sites including baseline survey information, habitat or vegetation quality scores, how the offset will be managed, and evidence that the protected matter is present or uses the offset site. The Offset Proposal must demonstrate how the proposed offset is suitable and meets the principles of the EPBC Offsets Policy and must include sufficient information for the department to assess it using the EPBC Offsets Assessment Guide.
2. **Offset Management Plan (OMP)** – The OMP supports the Offset Proposal and must detail all the management activities to be undertaken at the offset site including setting environmental objectives, milestones, monitoring and reporting measures. Management

[1] https://www.dcceew.gov.au/environment/epbc/publications/epbc-act-environmental-offsets-policy

plans and activities must be targeted towards the specific plant, animal, ecological community, or place (protected matter) that is being offset. If there is more than one offset site, then a separate OMP must be prepared for each site.

For further details regarding offset requirements and the requirements of an Offset Proposal and OMP, see Attachment B.

7. Habitat quality assessment

A methodology that is suitable for each listed threatened species or threatened ecological community (i.e., endorsed by the department or supported by literature) where there is a residual significant impact must be used to assess habitat quality, noting the same scoring mechanism must be used at both impact and offset sites.

The department encourages proponents to consult and seek endorsement from the department on a proposed method prior to undertaking any habitat quality assessment at both impact and offset site(s).

The department currently prefers habitat quality scoring methods for each prescribed matters to be consistent with the Modified Habitat Quality Assessment (MHQA) method. The MHQA tool derives habitat quality scores using an adaptation of the Queensland Government's 'Guide to determining terrestrial habitat quality version 1.2 (DEHP Guide).

The MHQA aligns, as far as possible the DEHP Guide with the requirements of the EPBC Act Environmental Offsets Policy for determining habitat quality scores. In aligning with this policy, all habitat quality scoring methods are required to generate future scores for 'with' and without' offset scenarios. Forecast gains or loss in habitat quality score must be substantiated by scientific information and via the endorsed MHQA (or alternative) method.

To support the habitat quality assessment, a link to the DEHP Guide, a MHQA scoring guide, and a MHQA scoring spreadsheet template (.xlsx) are provided herein. When calculating offsets, please refer to the department's published guidance: How to use the Offsets Assessment Guide.

A precautionary approach to forecasting scores should be applied, with all limitations and uncertainties considered, documented and integrated within the 'Confidence in Result % (Quality)' value applied in the Offset Assessment Guide (offset calculator). Please also note the following:

- If you propose a habitat quality gain of more than 2 points, or an achieved future habitat quality score 'with offset' of 9 or 10, it becomes less certain that the conservation outcome can be achieved. The justification of effectiveness of your proposed management measures and associated habitat quality score improvements and (reflected in the confidence in result) must be supported by substantial evidence.
- Higher habitat quality gains will generally be associated with lower 'confidence in result' scores in the Offset Assessments Guide to reflect the difficulty associated with achieving the conservation outcomes. In these cases, it is likely that outcomes-based commitments will be required in the associated management plan for the site, including specifying binding metrics to be met to demonstrate quality improvement. For further information, please contact the department to discuss the metrics that will be used to demonstrate achievement of quality standards.

If you intend to propose an alternative methodology for assessing and scoring habitat quality for

any/all of the prescribed matters likely to experience significant residual impacts as a result of the proposed action, the alternative methodology must:

- directly relate to habitat requirements of the species and factors associated with the viability of the prescribed matter, and align with information contained in the SPRAT database and relevant statutory/departmental documents, and
- be substantiated with appropriate field surveys in accordance with the relevant survey guidelines or using a scientifically robust and repeatable methodology.

Where there are any inconsistencies between the habitat assessment approach and information contained in the SPRAT database, the inconsistencies must be discussed with the department prior to the submission of the assessment documentation and must be supported by scientific evidence including published research, independent expert advice and information derived from field surveys.

8. Economic and social matters

If not previously provided in the referral documentation, the preliminary documentation must:	
8.1.	Provide details on the social and economic costs and/or benefits of undertaking the proposed action, including the basis for any estimations of costs and/or benefits. Where possible, please include the total economic capital investment and economic ongoing value of the project.
8.2.	Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.
8.3.	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.
8.4.	Provide details of any consultation with Indigenous stakeholders. **Indigenous engagement** Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts. Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. This should include: a) details regarding the specific Indigenous groups and Traditional Owners consulted and an indication of the areas, both tangible and intangible, of cultural significance across the project site; and b) a discussion about how impacts to areas and/or objects of Indigenous cultural significance (tangible and intangible) are avoided, mitigated or minimised. The department considers that best practice consultation, in accordance with the *Interim Engaging with First Nations People and Communities on Assessment and Approvals under the EPBC Act 1999 (2023)* includes:

	a) identifying and acknowledging all relevant affected Indigenous peoples and communities. b) committing to early engagement. c) building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management. d) setting appropriate timeframes for consultation and submission formats; and e) demonstrating cultural awareness and ensuring cultural safety. Describe any state requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action with regards to Indigenous peoples and communities.

9. Ecologically sustainable development

If not previously provided in the referral, the preliminary documentation must:	
9.1.	Provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act, which are as follows: (a) decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations. (b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. (c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations. (d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making

10. Environmental record of the person proposing to take the action

Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:	
10.1.	the person proposing to take the action;
10.2.	for an action for which a person has applied for a permit, the person making the application;
10.3.	if the person is a body corporate—the history of its executive officers in relation to environmental matters; and

10.4.	if the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.

11. Ecological data provision

The preliminary documentation must include an appendix of occurrence records (both sightings and evidence of presence) for all listed threatened and migratory species identified during field surveys for the proposed action. This data may be used by the department to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST).

The species occurrence records must be provided in accordance with the department's *Guidelines for biological survey and mapped data* (2018) using the *species observation data template*. Sensitive ecological data must be identified and treated in accordance with the department's *Sensitive Ecological Data – Access and Management Policy V1.0* (2016) or subsequent revision.

ATTACHMENT B

INFORMATION REQUIREMENTS FOR EPBC ACT OFFSET PROPOSALS AND OFFSET MANAGEMENT PLANS

An EPBC Act offset proposal must demonstrate that the relevant species or ecological communities significantly impacted by the proposed action is not worse-off when compared to a situation where neither the impact nor the offset occurred.

1. Offset Proposal requirements

Further to Section 6 of the PD request, the offset proposal must include, but not be limited to, the following:	
1.1.	A detailed project description, including a site description and how and to what extent your action will impact on protected matters.
1.2.	Details of the protected matters being impacted by the proposed action, including the total number of individuals and/or extent of habitat being impacted.
1.3.	Details about the offset proposal/offset site, including: a) A description of the proposed offset site(s) including location, size, and relevant ecological/species habitat features, landscape context and cadastre boundaries of the offset site(s) (supported by mapping). b) Information about how the proposed offset/s area will provide connectivity with other relevant habitats and biodiversity corridors. c) Information how the proposed offset site/s contribute to relevant State and/or regional plan/s or initiatives for the conservation of the protected matter. d) Evidence of the presence of, or usage by, relevant MNES on, or adjacent to the proposed offset site(s) e) Evidence that the location of the offset site is suitable and provides a conservation benefit to the impacted protected matter. Note: The EPBC Offsets Policy states that in most cases, the offset site should be as close to the impact as possible. f) Up to date surveys and baseline data confirming the current condition/quality of vegetation on site (including number of hollow bearing trees if relevant), the extent and presence of weeds, and the extent of threats. g) Information about the ecosystems present, current usage of the site, its general condition and location in the landscape/region h) An assessment of how the offset and impacts sites are like-for-like, i.e., the environmental values for the MNES at the offset are of the same type or equivalent to that affected by the proposed action. i) The methodology, with justification and supporting evidence, used to inform the inputs of the Offsets Assessment Guide in relation to the offset site for each

	relevant MNES, including: a. total area of habitat (in hectares) b. habitat quality (as discussed in section 8) c. time over which loss is averted (max. 20 years) d. time until ecological benefit e. risk of loss (%) without offset f. risk of loss (%) with offset g. confidence in result (%). j) Details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the potential offset area/s against development incompatible with conservation.
1.4.	The Offset Proposal must demonstrate how the offset meets the principles of the EPBC Offsets Policy and EPBC Offsets Assessment Guide to inform the Minister's decision on whether or not the project should be approved under the EPBC Act.
1.5.	Details of the actual or estimated cost of the offset proposal including costs associated with proposed mitigation and management measures onsite.
1.6.	Details of the protective mechanism proposed to be applied at any offset site/s to provide enduring protection to the site for at least the duration of the impact, including a draft of the protective mechanism and its terms.

2. Offset Management Plan (OMP) requirements

An offset management plan is a practical document that outlines what must be done to manage an offset site. A plan must detail all the management activities at the offset site and how progress will be monitored and reported. An OMP provides confidence that the outcomes described in an offset proposal can and will be achieved. The OMP must include, but may not be limited to:

2.	A description of the proposed offset site(s) including location, size, condition, existing and future tenure, and relevant ecological/species values present and surrounding land uses.
2.2.	Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g., physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant MNES that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares).
2.3.	Baseline survey information showing MNES presence and the extent and quality of the respective habitat(s) at the proposed offset site(s) in accordance with the relevant

	survey guidelines or using a scientifically robust and repeatable methodology.
2.4.	Summarised details of the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s.
2.5.	Information about how the proposed offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant MNES. This should include information about how the proposed offset/s area contributes to any state and/or regional plan/s for the conservation of the protected matter.
2.6.	Mechanisms for protection, for at least the full duration of the impact, under a conservation covenant or otherwise accepted method, noting that protection mechanisms for permanent impacts should continue in perpetuity.
2.7.	Completion criteria and, if necessary, performance targets that evidence protection or improvement of EPBC Act listed communities, species and their habitat. For the purpose of the plan: a) completion criteria are longer term time-bound values, specified for measurable parameters, that if attained and maintained ensure the plan's environmental objectives are achieved; and For example: 'By Year 20, the approval holder must reduce non-native plant cover to within 5% of the benchmark value associated with each Regional Ecosystem.' b) performance targets are time-bound short and medium term targets, for management interventions and environmental condition, that are used to monitor, evaluate, review and improve the effectiveness of the plan to offset impacts. For example: 'By Year 10, the approval holder must reduce non-native plant cover to within 10% of the benchmark value associated with each Regional Ecosystem.'
2.8.	The plan includes management measures that will protect or improve EPBC Act listed threatened ecological communities and/or species and their habitat. Each management measure: a) is specifically linked to the attribute of the protected matter for which the management measure applies; b) has timeframes for implementation; c) is described sufficiently to avoid ambiguity and to inform plan implementation; d) is related to attaining/maintaining completion criteria and/or performance targets; and e) is derived from recognised principles, practice, or guidelines, and is justified - technically, scientifically and legally (e.g. by recommendation in a national recovery plan) – as an effective and appropriate measure to attain and/or maintain the

	plan's completion criteria and/or performance targets. Management activities must be targeted towards the needs of the protected matter that is offset, and must align with the recovery objectives for the species as identified in relevant National Recovery Plans or Conservation Advices.
2.9.	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.
2.10.	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 may 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.
2.11.	The plan manages the risk of failure to achieve performance targets and/or completion criteria by: a) specifying management measures that will be implemented to attain/maintain the completion criteria and/or performance targets; b) enhancing monitoring and management measures for high risk events or circumstances, thereby providing a 'margin of safety' to detect, avoid or mitigate the likelihood and/or impacts of the event or circumstance; c) specifying measurable events or circumstances (management triggers) that detect actual or potential issues in a timely manner to avoid, minimise or mitigate adverse

	impacts; d) ensuring the monitoring program includes activities to detect management triggers, and explains how monitoring activities may inform the selection and implementation of corrective actions; e) specifying methods to be used to determine whether the management trigger is project attributable; f) specifying effective and appropriate corrective actions that may be implemented if a management trigger is realised; and g) monitoring the effectiveness of corrective actions and implementing appropriate responses in the event corrective actions are not effective.
2.12.	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 may 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.
2.13.	The plan describes the monitoring methods that will be implemented, and: a) demonstrates the relevance of the monitoring methods to the protection of the relevant aspect of the protected matter(s) for which the offset is implemented; b) includes quantitative (e.g. on-ground survey results) and qualitative baseline data (e.g. photo-point monitoring sites) that establish the start quality/condition of the environment and which can be used to measure performance against; c) describes the sampling strategy (including monitoring area, site selection and sampling intensity over space and time) and statistical analyses to be employed; d) justifies the sampling strategy/monitoring methods, including through: e) an assessment of effectiveness and constraints to use; f) capacity to detect change in environmental condition due to management

	interventions; g) capacity to demonstrate attainment of performance targets and/or completion criteria; and h) the statistical power of the strategy/method. i) commits to engage appropriately qualified experts to design and conduct monitoring and survey activities, and analyse monitoring results; j) accounts for seasonal/climatic variability; and k) details the location, nature and number of monitoring sites, including benchmark/reference sites to evaluate management performance.
2.14.	The plan includes commitments to report on plan implementation and success as well as opportunities for improvement. This is achieved by: a) if the project is approved, identifying relevant reporting obligations under the EPBC approval, or otherwise proposing appropriate regular reporting intervals, objectives and methods; b) specifying how plan/strategy implementation will be reported in accordance with those obligations; c) including a reporting template specifying key risk management, management measures, monitoring and adaptive implementation outcomes for the reporting period; and d) including a schedule and triggers for reporting types (e.g. annual compliance, incident, non-compliance, contingency).

ATTACHMENT C

Comments from the National Indigenous Australians Agency (NIAA) on Ripley Residential Development Project, 187-197 Binnies Road, Ripley, Queensland (EPBC 2024/09865)

First Nations engagement

The NIAA recommends that proponents ensure they have identified and engaged with the Traditional Owners and other First Nations stakeholders with interests in a project and have provided them with sufficient time and information to make informed assessments of the possible impact of the project on their interests. We recommend that proponents engage directly and actively with the Traditional Owners and any other First Nations stakeholders on the range of potential environmental, cultural, social and economic interests and concerns they may have in relation to a project. We recommend that this engagement be ongoing for the life of the project, including development, construction, operation and any project decommissioning.

Recent guidance on principles for culturally appropriate and respectful First Nations engagement is provided by the Department of Climate Change, Energy, the Environment and Water in *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999*. The Guide, *Clean Energy Agreement Making on First Nations Land*, also includes useful points for proponents to consider.

The NIAA recommends that proponents ensure they engage with the Traditional Owners who speak for particular Country. There may be a number of different First Nations people, groups and organisations with rights and interests related to a particular project. Proponents should be aware of the Native Title, land owning, representative, community or First Nations local government organisations in their area, who can often help in the identification of the relevant Traditional Owners and groups for consultation.

It can be helpful for proponents to develop First Nations stakeholder engagement plans. The plans should be developed in collaboration with the relevant First Nations stakeholders and document their preferences for engagement methods and frequency.

To support and strengthen relationships between proponents and Traditional Owners, the NIAA encourages proponents to consider developing a formal agreement with the relevant Traditional Owner group. Where relevant, this may be an Indigenous Land Use Agreement (ILUA) with Native Title claimants or Native Title holders. An agreement can provide a framework for ongoing consultations, dispute management, environmental and cultural heritage management, land and water access, and economic opportunities and partnerships.

Native Title

Proponents are advised to ascertain whether there are any Native Title claims, determinations or settlements relevant to a proposed project. The National Native Title

Tribunal's website and Native Title Vision (nntt.gov.au) may provide related information. Where a Native Title claim, determination or settlement is identified, we recommend the proponent consult with the claimants, Native Title holders or settlement body through their relevant Native Title representative body and service provider, legal representative, Prescribed Body Corporate or other relevant organisation. Native Title Vision provides some information on the relevant bodies.

The NIAA advises that the absence of Native Title claims or determinations over all or sections of a project area does not necessarily mean Native Title does not exist. While Native Title rights and interests will likely have been extinguished over any freehold land tenure, it may still exist over other land tenures, such as Crown Land and leases or offshore areas. Where a project is not on freehold or exclusive land tenure types, we recommend that proponents seek advice from the relevant state or territory government on whether any requirements under the future act provisions of the *Native Title Act 1993* apply prior to commencing works.

Cultural Heritage

The NIAA recommends that proponents assess the potential cultural heritage impacts of a project in collaboration with the relevant Traditional Owners, knowledge holders and other First Nations stakeholders, who may include First Nations organisations appointed under state or territory First Nations cultural heritage legislation. We recommend that this assessment include on-site inspections with the Traditional Owners and knowledge holders, and consideration of both tangible and intangible cultural heritage values. Intangible values can include songlines, dreaming sites, associations with biogeographic features, and culturally significant flora and fauna species.

The NIAA recommends that proponents collaborate with the relevant Traditional Owners, knowledge holders and other relevant First Nations stakeholders following the cultural heritage assessment to develop agreed measures for the protection and management of First Nations cultural heritage. Depending on the nature, size and potential impacts of a project, we recommend that proponents consider developing a Cultural Heritage Management Plan (CHMP) for the project that includes:

- the outcomes of the cultural heritage assessment;
- measures agreed with the Traditional Owners for the protection and management of both tangible and intangible cultural heritage values and mitigation of impacts;
- agreed protocols for the identification, protection and management of any cultural heritage values discovered during the project; and
- delivery of cultural awareness training to project staff and contractors to ensure that CHMP measures are implemented.

Economic opportunities and partnerships

The NIAA encourages the engagement of First Nations employees and businesses to help realise the economic benefit of a project for the local First Nations community. We

encourage proponents to discuss opportunities for First Nations people and businesses with Traditional Owners and other First Nations stakeholders.

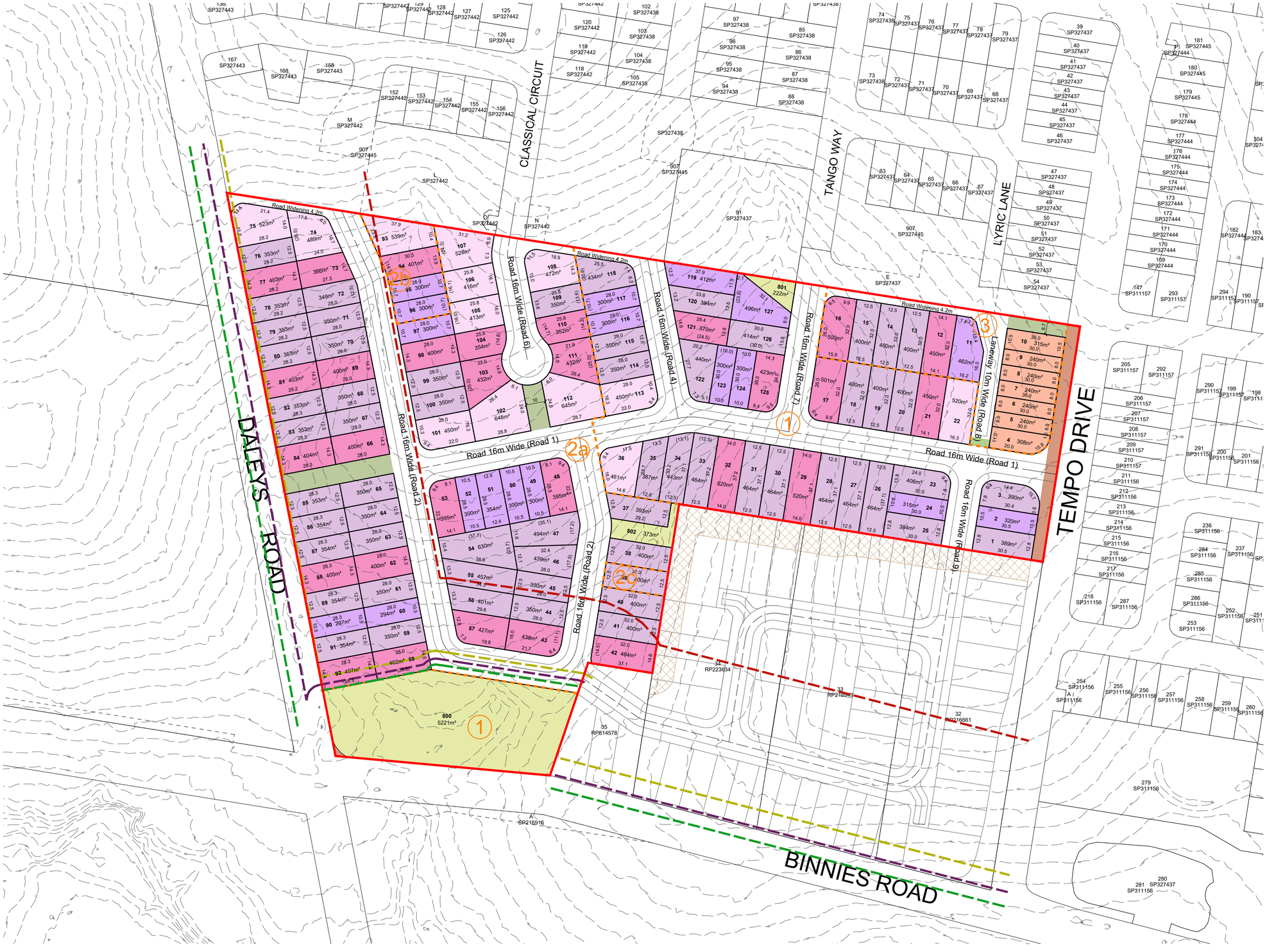
To support First Nations economic participation, we recommend proponents develop a First Nations employment, training and procurement plan incorporating participation targets. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts' *Indigenous Employment and Supplier-use Infrastructure Framework* and the Australian Government's *Indigenous Procurement Policy* contain useful tools for setting employment and business procurement targets respectively.

Proponents may wish to contact local employment providers such as Workforce Australia to connect with potential First Nations employees. Likewise, Supply Nation maintains an online directory that can be used to identify suitable First Nations businesses to support a project.

Attachment A2

Plan of Development

PROPOSAL PLAN - OVERALL



NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

NOTES

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Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These 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 subdivision design or for any financial dealings involving the land.

Pavements and centrelines shown are indicative only and are subject to Engineering Design.

Saunders Havill Group 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 the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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PROJECTION: GDA2020 MGA56
SUBJECT BOUNDARIES: DCDB
CONTOURS: ELVIS - LIDAR (2017)

LEGEND

- Site Boundary
- Contours (1.0m interval)
- Stage Boundary
- (1) Stage No.
- Bushfire Buffer
- BAL 12.5
- BAL 19
- BAL 29
- BAL 40

DEVELOPMENT STATISTICS			
RESIDENTIAL ALLOTMENTS	**No. Lots**	**%**	**Net Area**
Terrace	7	5.5%	0.182 ha
10.0m - 12.49m Frontage	18	14.2%	0.594 ha
12.5m - 13.9m Frontage	60	47.2%	2.352 ha
14.0m - 15.9m Frontage	29	22.8%	1.221 ha
16m + Irregular Frontage	13	10.2%	0.655 ha
Total Residential Allotments	**127**	**100.0%**	**5.004 ha**
Land Budget	**Area (Ha)**	**%**	
Area of Subject Site / Stage	7.527 ha	—	
Net Residential Area (no roads)	5.004 ha	66.5%	
Detention / Drainage	0.581 ha	7.7%	
Pedestrian Links	0.100 ha	1.3%	
Road Widening	0.077 ha	1.0%	
Road Areas	1.765 ha	23.4%	
Total	**7.527 ha**	**100.0%**	

RP DESCRIPTION: Lot 335 on RP814578

SCALE @A1 1:600 @A3 1:1200 - LENGTHS ARE IN METRES

10 0 10 20 30 40 50 60 70

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PROPOSAL PLAN - STAGE 1

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NOTES

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No reliance should be placed on the information on this plan for detailed subdivision design or for any financial dealings involving the land.

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PROJECTION: GDA2020 MGA56
SUBJECT BOUNDARIES: DCDB
CONTOURS: ELVIS - LIDAR (2017)

LEGEND

- Site Boundary
- Contours (1.0m interval)
- Stage Boundary
- (1) Stage No.

DEVELOPMENT STATISTICS - Stage 1			
RESIDENTIAL ALLOTMENTS	**No. Lots**	**%**	**Net Area**
10.0m - 12.49m Frontage	8	21.1%	0.274 ha
12.5m - 13.9m Frontage	21	55.3%	0.877 ha
14.0m - 15.9m Frontage	6	15.8%	0.278 ha
16m + Irregular Frontage	3	7.9%	0.143 ha
Total Residential Allotments	**38**	**100.0%**	**1.572 ha**

Land Budget	**Area (Ha)**	**%**	
Area of Subject Site / Stage	2.875 ha	—	
Net Residential Area (no roads)	1.572 ha	54.7%	
Detention / Drainage	0.544 ha	18.9%	
Road Widening	0.077 ha	2.7%	
Road Areas	0.682 ha	23.7%	
Total	**2.875 ha**	**100.0%**	

RP DESCRIPTION: Lot 335 on RP814578

SCALE @A1 1:600 @A3 1:1200 - LENGTHS ARE IN METRES

10 0 10 20 30 40 50 60 70

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PROPOSAL PLAN - STAGE 2

NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

NOTES

This plan was prepared as a conceptual layout only. The information on this plan is not suitable for any other purpose.

Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These 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 subdivision design or for any financial dealings involving the land.

Pavements and centrelines shown are indicative only and are subject to Engineering Design.

Saunders Havill Group 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 the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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PROJECTION: GDA2020 MGA56
SUBJECT BOUNDARIES: DCDB
CONTOURS: ELVIS - LIDAR (2017)

LEGEND

- Site Boundary
- Contours (1.0m interval)
- Stage Boundary
- (1) Stage No.
- BAL 12.5
- BAL 19
- BAL 29
- BAL 40

DEVELOPMENT STATISTICS - Stage 2			
RESIDENTIAL ALLOTMENTS	**No. Lots**	**%**	**Net Area**
10.0m - 12.49m Frontage	9	11.8%	0.274 ha
12.5m - 13.9m Frontage	36	47.4%	1.355 ha
14.0m - 15.9m Frontage	21	27.6%	0.848 ha
16m + Irregular Frontage	10	13.2%	0.512 ha
Total Residential Allotments	**76**	**100.0%**	**2.989 ha**
Land Budget	**Area (Ha)**	**%**	
Area of Subject Site / Stage	4.080 ha	0.0%	
Net Residential Area (no roads)	2.989 ha	73.3%	
Detention / Drainage	0.037 ha	0.9%	
Pedestrian Links	0.080 ha	2.0%	
Road Areas	0.974 ha	23.9%	
Total	**4.080 ha**	**100.0%**	

RP DESCRIPTION: Lot 335 on RP814578

SCALE @A1 1:600 @A3 1:1200 - LENGTHS ARE IN METRES

10 0 10 20 30 40 50 60 70

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187 - 197 BINNIES ROAD, RIPLEY • 03/04/2025 • 11826 P 07 Rev I - STG 02

PROPOSAL PLAN - STAGE 3

NOT TO BE USED FOR ENGINEERING DESIGN OR CONSTRUCTION

NOTES

This plan was prepared as a conceptual layout only. The information on this plan is not suitable for any other purpose.

Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These 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 subdivision design or for any financial dealings involving the land.

Pavements and centrelines shown are indicative only and are subject to Engineering Design.

Saunders Havill Group 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 the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

DCDB © State of Queensland (Department of Natural Resources and Mines) 2019.
Lidar Data © State of Queensland (Department of Natural Resources and Mines) 2016.

* This note is an integral part of this plan/data. 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.

PROJECTION: GDA2020 MGA56
SUBJECT BOUNDARIES: DCDB
CONTOURS: ELVIS - LIDAR (2017)

LEGEND

- Site Boundary
- Contours (1.0m interval)
- Stage Boundary
- (1) Stage No.

DEVELOPMENT STATISTICS - Stage 3			
RESIDENTIAL ALLOTMENTS	**No. Lots**	**%**	**Net Area**
Terrace	7	53.8%	0.182 ha
10.0m - 12.49m Frontage	1	7.7%	0.046 ha
12.5m - 13.9m Frontage	3	23.1%	0.120 ha
14.0m - 15.9m Frontage	2	15.4%	0.095 ha
Total Residential Allotments	**13**	**100.0%**	**0.443 ha**

Land Budget	**Area (Ha)**	**%**	
Area of Subject Site / Stage	0.572 ha	—	
Net Residential Area (no roads)	0.443 ha	77.4%	
Pedestrian Links	0.020 ha	3.5%	
Road Areas	0.109 ha	19.1%	
Total	**0.572 ha**	**100.0%**	

RP DESCRIPTION: Lot 335 on RP814578

SCALE @A1 1:600 @A3 1:1200 - LENGTHS ARE IN METRES

10 0 10 20 30 40 50 60 70

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Attachment A3

Impact MHQA Data Sheets

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	1	Job Number / Property	11826

Part B - Site Data

Recorders	LB and JP	Date	12.08.2024

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		12.9-10.2	

Site description and Location (including details of discrete polygons within the assessment unit)
Corymbia citriodora dominated. Weeds in central drainage line. Leaf litter.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	8			EDL / Dom / R
Scientific Name	*Corymbia citriodora*	Common Name	Spotted gum	EDL/R
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest red gum	EDL/R
Scientific Name	*Acacia disparima*	Common Name	Hickory wattle	
Scientific Name	*Corymbia intermedia*	Common Name	Pink bloodwood	
Scientific Name	*Petalostigma pubescens*	Common Name	Quinine Bush	
Scientific Name	*Eucalyptus melanophloia*	Common Name	Silver-leaved Ironbark	
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark	
Scientific Name	*Lophostemon suaveolens*	Common Name	Swamp Box	
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	6		
Scientific Name	*Alphitonia excelsa*	Common Name	Soap tree
Scientific Name	*Acacia leiocalyx*	Common Name	Early Flowering Black Wattle
Scientific Name	*Corymbia citriodora*	Common Name	Spotted gum
Scientific Name	*Acacia disparima*	Common Name	Hickory wattle
Scientific Name	*Lophostemon suaveolens*	Common Name	Swamp Box
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	5		
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed wire grass
Scientific Name	*Panicum decompositum*	Common Name	Native millet
Scientific Name	*Entolasia stricta*	Common Name	Wiry panic
Scientific Name	*Imperata cylindrica*	Common Name	Blady grass
Scientific Name	*Aristida vagans*	Common Name	Threeawn Speargrass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	3		
Scientific Name	*Goodenia rotundifolia*	Common Name	Star Goodenia
Scientific Name	*Gahnia aspera*	Common Name	Saw Sedge
Scientific Name	*Lepidosperma laterale*	Common Name	Variable Swordsedge
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	10.00%		
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Opuntia tomentosa*	Common Name	Velvet Tree Pear
Scientific Name	*Passiflora suberosa*	Common Name	Corky Passion Vine
Scientific Name	*Lantana montevidensis*	Common Name	Creeping Lantana
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	159.00		
1	3.20	26	
2	4.00	27	
3	2.10	28	
4	0.80	29	
5	1.00	30	
6	3.50	31	
7	1.30	32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	30%	35%	5%	15%	40%	25%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	3%	0%	0%	0%	1%
Native shrubs	0%	0%	0%	0%	15%	3%
Non-native grass	0%	0%	0%	0%	0%	
Non native forbs and shrubs	0%	0%	0%	3%	15%	4%
Litter	70%	62%	95%	82%	30%	68%
Rock	0%	0%	0%	0%	0%	
Bare Ground	0%	0%	0%	0%	0%	
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	(9) Eucalyptus citriodora - 420, 540, 380, 400, 480, 430. Eucalyptus crebra- 450. Eucalyptus tereticornis 580. Corymbia intermedia - 550
Non- Eucalypt Large tree DBH benchmark used:		Number of large non eucalypt trees:	0
Total number of large trees recorded:	9		
Total Number Large Trees per ha:	18		

Median Tree Canopy Height Measurements	Canopy:	18	Sub-canopy:	10	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	1

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	59.9%	Sub-canopy:	35.20%	Emergent:	
Shrub canopy cover %	5.60%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1 EDL	0.0	25.6	25.6	T2	15.5	18.5	3.0
T1 EDL	34.2	48.8	14.6	T2	22.5	24.4	1.9
T1 EDL	53.5	57.1	3.6	T2	31.7	34.0	2.3
T1 EDL	62.1	69.7	7.6	T2	54.5	56.9	2.4
T1 EDL	78.1	86.6	8.5	T2	59.5	60.0	0.5
T1			0.0	T2	73.0	93.9	20.9
T1			0.0	T2	95.8	100.0	4.2
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	14.2	14.6	0.4	Shrub	89.7	92.1	2.4
Shrub	26.2	26.4	0.2	Shrub			0.0
Shrub	78.1	78.7	0.6	Shrub			0.0
Shrub	80.4	82.4	2.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus tereticornis	2
Lophostomon sauveolens	17
Corymbia citriodora	32
Corymbia intermedia	4
Eucalyptus crebra	2
Eucalyptus melanaphloia	2

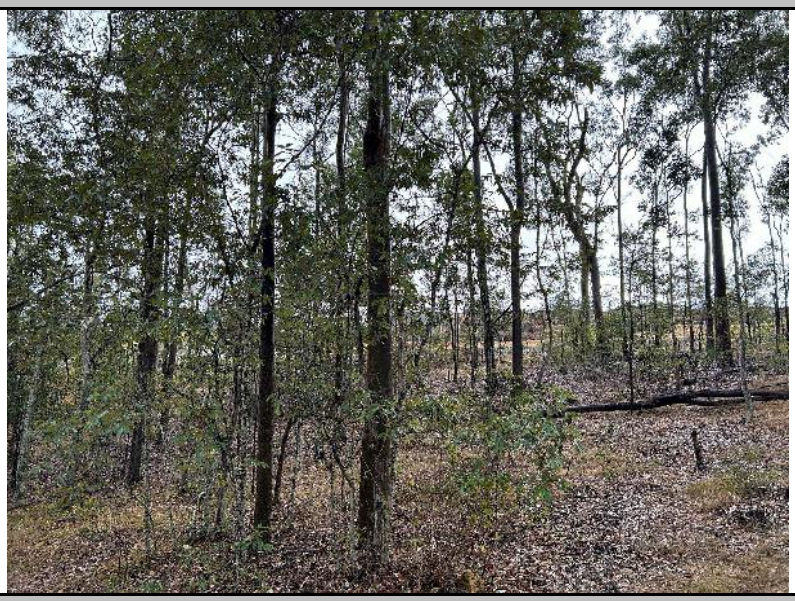
	59
	295

Part J: SAT Survey Results

SAT Survey ID	NA			
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Eucalyptus tereticornis*	Forest red gum	220	N
2	*Corymbia citriodora*	Spotted gum	200	N
3	*Corymbia citriodora*	Spotted gum	160	N
4	*Corymbia citriodora*	Spotted gum	300	N
5	*Corymbia citriodora*	Spotted gum	300	N
6	*Corymbia citriodora*	Spotted gum	130	N
7	*Corymbia citriodora*	Spotted gum	270	N
8	*Corymbia citriodora*	Spotted gum	130	N
9	*Corymbia citriodora*	Spotted gum	240	N
10	*Corymbia citriodora*	Spotted gum	310	N
11	*Eucalyptus tereticornis*	Red forest gum	250	N
12	*Corymbia citriodora*	Spotted gum	200	N
13	*Corymbia citriodora*	Spotted gum	230	N
14	*Corymbia citriodora*	Spotted gum	200	N
15	*Corymbia citriodora*	Spotted gum	110	N
16	*Corymbia citriodora*	Spotted gum	150	N
17	*Corymbia citriodora*	Spotted gum	130	N
18	*Corymbia citriodora*	Spotted gum	140	N
19	*Eucalyptus tereticornis*	Red forest gum	100	N
20	*Corymbia intermedia*	Pink Bloodwood	100	N
21	*Corymbia intermedia*	Pink Bloodwood	100	N
22	*Eucalyptus crebra*	Narrow-leaved Ironbar	100	N
23	*Corymbia citriodora*	Spotted gum	350	N
24	*Corymbia citriodora*	Spotted gum	400	N
25	*Corymbia citriodora*	Spotted gum	200	N
26	*Corymbia citriodora*	Spotted gum	500	N
27	*Eucalyptus crebra*	Narrow-leaved Ironbar	270	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbar	270	N
29	*Eucalyptus crebra*	Narrow-leaved Ironbar	310	N
30	*Eucalyptus crebra*	Narrow-leaved Ironbar	400	N
Total				0

Attach Landscape Photos Here

North



South





East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	2	Job Number / Property	11826

Part B - Site Data

Recorders	LB and JP	Date	12.08.2024

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		12.9-10.2	

Site description and Location (including details of discrete polygons within the assessment unit)
Corymbia citriodora dominated. Sparse shrubs and dense leaf litter.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	7			EDL / Dom / R
Scientific Name	*Corymbia citriodora*	Common Name	Spotted gum	EDL/R
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest red gum	
Scientific Name	*Corymbia tesselaris*	Common Name	Moreton bay ash	
Scientific Name	*Corymbia intermedia*	Common Name	Pink bloodwood	
Scientific Name	*Petalostigma pubescens*	Common Name	Quinine Bush	
Scientific Name	*Alphitonia excelsa*	Common Name	Soap tree	
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark	
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	6		
Scientific Name	*Alphitonia excelsa*	Common Name	Soap tree
Scientific Name	*Acacia leiocalyx*	Common Name	Early Flowering Black Wattle
Scientific Name	*Corymbia citriodora*	Common Name	Spotted gum
Scientific Name	*Acacia disparima*	Common Name	Hickory wattle
Scientific Name	*Allocasuarina luehmannii*	Common Name	Bull oak
Scientific Name	*Jacksonia scoparia*	Common Name	Dogwood
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	3		
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed wire grass
Scientific Name	*Imperata cylindrica*	Common Name	Blady grass
Scientific Name	*Aristida vagans*	Common Name	Threeawn Speargrass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	3		
Scientific Name	*Goodenia rotundifolia*	Common Name	Star Goodenia
Scientific Name	*Lomandra longifolia*	Common Name	Long-leaved Matrush
Scientific Name	*Lobelia purpurascens*	Common Name	White Root
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	3.00%		
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Opuntia tomentosa*	Common Name	Velvet Tree Pear
Scientific Name	*Passiflora suberosa*	Common Name	Corky Passion Vine
Scientific Name	*Lantana montevidensis*	Common Name	Creeping Lantana
Scientific Name	*Leucaena leucocephala*	Common Name	Leucaena
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	196.00		
1	6.00	26	
2	0.80	27	
3	0.70	28	
4	0.60	29	
5	0.70	30	
6	3.00	31	
7	4.00	32	
8	3.80	33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	2%	0%	0%	0%	10%	2%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	0%	0%	0%	20%	4%
Native shrubs	0%	0%	20%	0%	0%	4%
Non-native grass	0%	0%	0%	0%	0%	
Non native forbs and shrubs	0%	0%	0%	0%	0%	
Litter	78%	100%	80%	100%	70%	86%
Rock	0%	0%	0%	0%	0%	
Bare Ground	20%	0%	0%	0%	0%	4%
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	Corymbia citriodora - 390, 380
Non- Eucalypt Large tree DBH benchmark used:		Number of large non eucalypt trees:	0
Total number of large trees recorded:	2		
Total Number Large Trees per ha:	4		

Median Tree Canopy Height Measurements	Canopy:	18	Sub-canopy:	10	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	1

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	68.5%	Sub-canopy:	20.60%	Emergent:	
Shrub canopy cover %	7.30%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1 EDL	0.0	22.4	22.4	T2	0.0	3.0	3.0
T1 EDL	33.4	57.1	23.7	T2	9.2	9.4	0.2
T1 EDL	71.1	75.9	4.8	T2	23.4	27.1	3.7
T1 EDL	82.4	100.0	17.6	T2	51.5	64.7	13.2
T1			0.0	T2	75.3	75.8	0.5
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	10.8	12.5	1.7	Shrub	89.1	90.1	1.0
Shrub	23.4	26.0	2.6	Shrub			0.0
Shrub	31.3	32.3	1.0	Shrub			0.0
Shrub	64.7	65.7	1.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Corymbia citriodora	38
Corymbia intermedia	2
Eucalyptus crebra	2
	42

	210

Part J: SAT Survey Results

SAT Survey ID	NA			
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Corymbia citriodora*	Spotted gum	200	N
2	*Corymbia intermedia*	Pink Bloodwood	140	N
3	*Corymbia citriodora*	Spotted gum	450	N
4	*Allocasuarina luehmani*	Bull Oak	200	N
5	*Corymbia citriodora*	Spotted gum	350	N
6	*Corymbia citriodora*	Spotted gum	300	N
7	*Corymbia citriodora*	Spotted gum	200	N
8	*Corymbia citriodora*	Spotted gum	210	N
9	*Corymbia citriodora*	Spotted gum	120	N
10	*Corymbia citriodora*	Spotted gum	140	N
11	*Corymbia citriodora*	Spotted gum	100	N
12	*Corymbia intermedia*	Pink Bloodwood	110	N
13	*Corymbia citriodora*	Spotted gum	200	N
14	*Corymbia citriodora*	Spotted gum	160	N
15	*Corymbia citriodora*	Spotted gum	150	N
16	*Corymbia intermedia*	Pink Bloodwood	120	N
17	*Corymbia citriodora*	Spotted gum	210	N
18	*Corymbia citriodora*	Spotted gum	310	N
19	*Eucalyptus crebra*	Narrow-leaved Ironbar	200	N
20	*Corymbia citriodora*	Spotted gum	180	N
21	*Eucalyptus crebra*	Narrow-leaved Ironbar	160	N
22	*Corymbia tessellaris*	Moreton Bay Ash	100	N
23	*Corymbia citriodora*	Spotted gum	250	N
24	*Corymbia citriodora*	Spotted gum	320	N
25	*Corymbia citriodora*	Spotted gum	430	N
26	*Corymbia citriodora*	Spotted gum	330	N
27	*Corymbia citriodora*	Spotted gum	380	N
28	*Corymbia citriodora*	Spotted gum	260	N
29	*Corymbia citriodora*	Spotted gum	250	N
30	*Corymbia citriodora*	Spotted gum	300	N
Total				0

Attach Landscape Photos Here

North



South





East



West



Table 4.1. Species in the blossom diet of Grey-headed flying foxes and their flower scores. Where more than one score was assigned to the species, the range is given. No scores are given for species that were not identified in descriptions of vegetation types. Species with high (≥0.65) wt p*r scores are indicated by shading. These are considered significant food plants for the animals.

Family	Species	Common name	Prod	Relia	Wt p*r
Fabaceae	*Castanospermum australe*	Black bean	0.77	1	0.83
Proteaceae	*Banksia integrifolia v. int*	Coast Banksia	0.77	1	0.83
	B. serrata	Old Man Banksia	0.54	0.30	0.45
	Grevillea robusta	Silky Oak	1	1	1
Myrtaceae	*Angophora costata*	Smooth-barked Apple	0.37	0.30	0.35
	A. floribunda	Rough-barked Apple	0.54	0.30	0.45
	A. leiocarpa		0.37	0.30	0.35
	Corymbia citriodora citriodora	Lemon-scented Gum	0.91	0.30	0.65
	C. eximia	Yellow Bloodwood	0.70	0.30	0.54
	C. gummifera	Red Bloodwood	0.91	0.30	0.65
	C. henryi	Large-lved Spotted Gum	0.70	0.30	0.54
	C. intermedia	Pink Bloodwood	1	0.60	0.86
	C. maculata	Spotted Gum	0.91	0.30	0.65
	C. tessellaris	Carbeen	0.61	0.15	0.40
	C. trachyphloia	Brown Bloodwood	0.54	0.30	0.45
	C. variegata	Northern Spotted Gum	0.91	0.30	0.65
	Eucalyptus acmenoides	White Mahogany	0.37	0.60	0.43
	E. albens	White Box	0.70	0.30	0.54
	E. amplifolia	Cabbage Gum	0.70	0.15	0.44
	E. andrewsii	New England Blackbutt	0.59	0.80	0.65
	E. bancrofti	Orange Gum	0.70	0.30	0.54
	E. botryoides	Southern Mahogany	0.54	0.45	0.51
	E. camaldulensis	River Red Gum	0.70	0.60	0.67
	E. campanulata	New England Blackbutt	0.37-0.54	0.30-0.45	0.39-0.45
	E. cloeziana	Gympie Messmate	0.47	0.15	0.34
	E. deanei	Mtn Blue Gum	0.70	0.80	0.73
	E. fibrosa	Broad-leaved Ironbark	0.70	0.30	0.54
	E. grandis	Flooded Gum	0.54	0.60	0.56
	E. longirostrata	Grey Gum	0.54	0.15	0.37
	E. maidenii	Maiden's Gum	0.54	0.30	0.45
	E. major	Grey Gum	0.54	0.15	0.37
	E. melanophloia	Silver-leaved Ironbark	0.54-0.70	0.30	0.45-0.54
	E. melliodora	Yellow Box	0.32	0.60	0.39
	E. moluccana	Grey Box	0.37-0.59	0.30-0.80	0.35-0.65
	E. muelleriana	Yellow Stringybark	0.47	0.30	0.41
	E. paniculata	Grey Ironbark	0.61	0.30	0.49
	E. parramattensis	Parramatta Red Gum	0.54	0.30	0.45
	E. pilularis	Blackbutt	0.54-0.80	0.45	0.51-0.67
	E. piperita	Sydney Peppermint	0.59	0.45	0.55
	E. planchoniana	Needlebark	0.70	0.30	0.54
	E. propinqua	Small-fruited Grey Gum	0.47	0.15	0.34
	E. punctata	Large-fruited Grey Gum	0.54	0.60	0.56
	E. pyrocarpa	Large-fruited Blackbutt	0.70	0.30	0.54
	E. resinifera	Red Mahogany	0.54	0.15	0.37
	E. robusta	Swamp Mahogany	1	1	1
	E. rummeryi	Steel Box	0.70	0.30	0.54
	E. saligna	Sydney Blue Gum	0.70	0.80	0.73
	E. seeana	Narrow-leaved Red Gum	0.77	0.80	0.78
	E. siderophloia	Grey Ironbark	0.91	0.60	0.81
	E. sideroxylon	Mugga Ironbark	0.70	0.30	0.54
	E. tereticornis	Forest Red Gum	0.54-0.91	0.15-0.60	0.37-0.88
	E. tricarpa	Red Ironbark	0.47	0.15	0.34
	Lophostemon confertus	Brush box	0.41	0.63-0.80	0.46
	M. quinquenervia	Five-veined Paperbark	0.91	0.80	0.88
	Syncarpia glomulifera	Turpentine	0.54-0.59	0.60-0.80	0.56-0.65

Taken from Eby and Law (2008). *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given its importance

Attachment A4

Raw SAT Data

Spot Assessment Technique (SAT)				
Date:	01.02.2024	**Site: 11826**	**SAT ID: 1**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	150	N
2	*Corymbia citriodora*	Spotted Gum	140	N
3	*Corymbia citriodora*	Spotted Gum	280	N
4	*Corymbia citriodora*	Spotted Gum	130	N
5	*Corymbia citriodora*	Spotted Gum	160	N
6	*Corymbia citriodora*	Spotted Gum	380	N
7	*Corymbia citriodora*	Spotted Gum	190	N
8	*Corymbia citriodora*	Spotted Gum	150	N
9	*Corymbia tessellaris*	Moreton Bay Ash	100	N
10	*Corymbia citriodora*	Spotted Gum	120	N
11	*Corymbia tessellaris*	Moreton Bay Ash	310	N
12	*Corymbia tessellaris*	Moreton Bay Ash	140	N
13	*Corymbia citriodora*	Spotted Gum	180	N
14	*Corymbia citriodora*	Spotted Gum	450	N
15	*Corymbia citriodora*	Spotted Gum	170	N
16	*Corymbia tessellaris*	Moreton Bay Ash	200	N
17	*Corymbia citriodora*	Spotted Gum	140	N
18	*Eucalyptus tereticornis*	Forest Red Gum	650	N
19	*Corymbia citriodora*	Spotted Gum	180	N
20	*Corymbia intermedia*	Pink Bloodwood	200	N
21	*Corymbia citriodora*	Spotted Gum	270	N
22	*Corymbia intermedia*	Pink Bloodwood	160	N
23	*Eucalyptus tereticornis*	Forest Red Gum	120	N
24	*Corymbia intermedia*	Pink Bloodwood	160	N
25	*Corymbia citriodora*	Spotted Gum	150	N
26	*Corymbia citriodora*	Spotted Gum	200	N
27	*Lophostemon suaveolens*	Swamp Box	140	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbark	110	N
29	*Corymbia intermedia*	Pink Bloodwood	120	N
30	*Corymbia citriodora*	Spotted Gum	120	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

Spot Assessment Technique (SAT)				
Date:	01.02.2024	**Site: 11826**	**SAT ID: 2**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Corymbia tessellaris*	Moreton Bay Ash	130	N
2	*Corymbia citriodora*	Spotted Gum	200	N
3	*Corymbia citriodora*	Spotted Gum	680	N
4	*Corymbia citriodora*	Spotted Gum	230	Y
5	*Corymbia citriodora*	Spotted Gum	380	N
6	*Corymbia citriodora*	Spotted Gum	100	N
7	*Corymbia citriodora*	Spotted Gum	400	N
8	*Corymbia citriodora*	Spotted Gum	170	N
9	*Corymbia citriodora*	Spotted Gum	130	N
10	*Corymbia citriodora*	Spotted Gum	350	N
11	*Eucalyptus tereticornis*	Forest Red Gum	270	N
12	*Corymbia citriodora*	Spotted Gum	230	N
13	*Corymbia citriodora*	Spotted Gum	150	N
14	*Corymbia citriodora*	Spotted Gum	270	N
15	*Corymbia citriodora*	Spotted Gum	110	N
16	*Corymbia citriodora*	Spotted Gum	270	Y
17	*Corymbia citriodora*	Spotted Gum	390	N
18	*Corymbia citriodora*	Spotted Gum	850	N
19	*Eucalyptus tereticornis*	Forest Red Gum	170	N
20	*Corymbia intermedia*	Pink Bloodwood	140	N
21	*Corymbia citriodora*	Spotted Gum	340	N
22	*Corymbia citriodora*	Spotted Gum	220	N
23	*Corymbia citriodora*	Spotted Gum	210	N
24	*Corymbia citriodora*	Spotted Gum	240	N
25	*Corymbia citriodora*	Spotted Gum	300	N
26	*Corymbia citriodora*	Spotted Gum	230	N
27	*Corymbia citriodora*	Spotted Gum	100	N
28	*Corymbia citriodora*	Spotted Gum	130	N
29	*Corymbia citriodora*	Spotted Gum	210	N
30	*Corymbia citriodora*	Spotted Gum	180	N
		Total Scats	2	
		Percentage	6.67	
		East Coast (med-high) Activity Category	Low	

Spot Assessment Technique (SAT)				
Date:	01.02.2024	**Site: 11826**	**SAT ID: 3**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Corymbia citriodora*	Spotted Gum	430	N
2	*Corymbia citriodora*	Spotted Gum	180	N
3	*Corymbia citriodora*	Spotted Gum	110	N
4	*Corymbia citriodora*	Spotted Gum	200	N
5	*Corymbia citriodora*	Spotted Gum	160	N
6	*Eucalyptus crebra*	Narrow-leaved Ironbark	340	N
7	*Corymbia citriodora*	Spotted Gum	130	N
8	*Corymbia citriodora*	Spotted Gum	350	N
9	*Corymbia citriodora*	Spotted Gum	220	N
10	*Corymbia citriodora*	Spotted Gum	110	N
11	*Corymbia citriodora*	Spotted Gum	350	N
12	*Corymbia citriodora*	Spotted Gum	120	N
13	*Corymbia citriodora*	Spotted Gum	170	N
14	*Corymbia citriodora*	Spotted Gum	330	N
15	*Corymbia citriodora*	Spotted Gum	220	N
16	*Corymbia citriodora*	Spotted Gum	180	N
17	*Corymbia citriodora*	Spotted Gum	360	N
18	*Corymbia citriodora*	Spotted Gum	180	N
19	*Corymbia citriodora*	Spotted Gum	110	N
20	*Corymbia citriodora*	Spotted Gum	210	N
21	*Corymbia citriodora*	Spotted Gum	310	N
22	*Corymbia citriodora*	Spotted Gum	100	N
23	*Corymbia citriodora*	Spotted Gum	270	N
24	*Corymbia citriodora*	Spotted Gum	210	N
25	*Corymbia citriodora*	Spotted Gum	300	N
26	*Corymbia citriodora*	Spotted Gum	170	N
27	*Corymbia citriodora*	Spotted Gum	190	N
28	*Corymbia citriodora*	Spotted Gum	320	N
29	*Corymbia citriodora*	Spotted Gum	130	N
30	*Eucalyptus crebra*	Narrow-leaved Ironbark	240	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

Spot Assessment Technique (SAT)				
Date:	12.08.2024	**Site: 11826**	**SAT ID: 4**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Eucalyptus tereticornis*	Forest red gum	220	N
2	*Corymbia citriodora*	Spotted gum	200	N
3	*Corymbia citriodora*	Spotted gum	160	N
4	*Corymbia citriodora*	Spotted gum	300	N
5	*Corymbia citriodora*	Spotted gum	300	N
6	*Corymbia citriodora*	Spotted gum	130	N
7	*Corymbia citriodora*	Spotted gum	270	N
8	*Corymbia citriodora*	Spotted gum	130	N
9	*Corymbia citriodora*	Spotted gum	240	N
10	*Corymbia citriodora*	Spotted gum	310	N
11	*Eucalyptus tereticornis*	Red forest gum	250	N
12	*Corymbia citriodora*	Spotted gum	200	N
13	*Corymbia citriodora*	Spotted gum	230	N
14	*Corymbia citriodora*	Spotted gum	200	N
15	*Corymbia citriodora*	Spotted gum	110	N
16	*Corymbia citriodora*	Spotted gum	150	N
17	*Corymbia citriodora*	Spotted gum	130	N
18	*Corymbia citriodora*	Spotted gum	140	N
19	*Eucalyptus tereticornis*	Red forest gum	100	N
20	*Corymbia intermedia*	Pink Bloodwood	100	N
21	*Corymbia intermedia*	Pink Bloodwood	100	N
22	*Eucalyptus crebra*	Narrow-leaved Ironbark	100	N
23	*Corymbia citriodora*	Spotted gum	350	N
24	*Corymbia citriodora*	Spotted gum	400	N
25	*Corymbia citriodora*	Spotted gum	200	N
26	*Corymbia citriodora*	Spotted gum	500	N
27	*Eucalyptus crebra*	Narrow-leaved Ironbark	270	N
28	*Eucalyptus crebra*	Narrow-leaved Ironbark	270	N
29	*Eucalyptus crebra*	Narrow-leaved Ironbark	310	N
30	*Eucalyptus crebra*	Narrow-leaved Ironbark	400	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

Spot Assessment Technique (SAT)				
Date:	12.08.2024	**Site: 11826**	**SAT ID: 5**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Corymbia citriodora*	Spotted gum	200	N
2	*Corymbia intermedia*	Pink Bloodwood	140	N
3	*Corymbia citriodora*	Spotted gum	450	N
4	*Allocasuarina luehmannii*	Bull Oak	200	N
5	*Corymbia citriodora*	Spotted gum	350	N
6	*Corymbia citriodora*	Spotted gum	300	N
7	*Corymbia citriodora*	Spotted gum	200	N
8	*Corymbia citriodora*	Spotted gum	210	N
9	*Corymbia citriodora*	Spotted gum	120	N
10	*Corymbia citriodora*	Spotted gum	140	N
11	*Corymbia citriodora*	Spotted gum	100	N
12	*Corymbia intermedia*	Pink Bloodwood	110	N
13	*Corymbia citriodora*	Spotted gum	200	N
14	*Corymbia citriodora*	Spotted gum	160	N
15	*Corymbia citriodora*	Spotted gum	150	N
16	*Corymbia intermedia*	Pink Bloodwood	120	N
17	*Corymbia citriodora*	Spotted gum	210	N
18	*Corymbia citriodora*	Spotted gum	310	N
19	*Eucalyptus crebra*	Narrow-leaved Ironbark	200	N
20	*Corymbia citriodora*	Spotted gum	180	N
21	*Eucalyptus crebra*	Narrow-leaved Ironbark	160	N
22	*Corymbia tessellaris*	Moreton Bay Ash	100	N
23	*Corymbia citriodora*	Spotted gum	250	N
24	*Corymbia citriodora*	Spotted gum	320	N
25	*Corymbia citriodora*	Spotted gum	430	N
26	*Corymbia citriodora*	Spotted gum	330	N
27	*Corymbia citriodora*	Spotted gum	380	N
28	*Corymbia citriodora*	Spotted gum	260	N
29	*Corymbia citriodora*	Spotted gum	250	N
30	*Corymbia citriodora*	Spotted gum	300	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

Attachment A5

Offset Management Plan



Offset Management Plan EPBC (2024/09865)

Residential Development, Ripley Residential Development Project

187-197 Binnies Road, Ripley, QLD, 4306

Mount View Offset Area

18 February 2026



Saunders Havill

PATHWAYS TO SUCCESS

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Appendices

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Appendix E: Risk Assessment
Appendix F: Rehabilitation Plan

Acronyms & Definitions

ACR	Annual Compliance Report
ASL	Above Sea Level
AU	Assessment Unit
BMP	Bushfire Management Plan
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DSH	Diameter Standard Height (previously Diameter Breast Height)
EDL	Ecologically Dominant Layer
EOP	Environmental Offsets Policy
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
FHA	Foraging Habitat Assessment
GBO	General Biodiversity Obligation
GHFF	Grey-headed Flying-fox
Ha	hectares
Km	kilometres
m	metres
MHQA	Modified Habitat Quality Assessment
MNES	Matters of National Environmental Significance
MVOA	Mount View Offset Area
MVOP	Mount View Offset Property
OAAR	Offset Area Annual Report
OAG	Offset Assessment Guide
OMP	Offset Management Plan
OMU	Operational Management Unit
RAI	Relative Abundance Index
RE	Regional Ecosystem
RVPDA	Ripley Valley Priority Development Area
SAT	Spot Assessment Technique
SEQ	South-east Queensland
SEQERF	South-east Queensland Ecological Restoration Framework
SPRAT	Species Profile and Threats Database
SRRC	Scenic Rim Regional Council
SH	Saunders Havill
SSR	Species Stocking Rate
QLD	Queensland
VCFMP	Vegetation Clearing and Fauna Management Plan
VDEC	Voluntary Declaration
VMA	Vegetation Management Act 1999
WONS	Weeds of National Significance

Impact area – The area where clearing will occur. This is the entire referral area located at 87-197 Binnies Road, Ripley, Queensland, 4306, described as Lot 335 on RP814578.

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 property – Means 'Mount View Offset Property', 510 Oaky Scrub Road, Oaky Creek, QLD, 4285. Formally described as Lots 23 and 24 on RP47247, an area of 314.7 ha.

Mount View Offset Area (MVOA) – The 25-ha area within the offset property where the specific offset will be implemented and consists of three assessment units.

Year 1 of the offset – the 12-month period following legal securement of the Mount View Offset Area.

Years 2 to 20 of the offset – The 12-month period following each anniversary of the legal securement of the Mount View Offset Area.

Life of the offset – 20-year period following legal securement of the Mount View 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 4 of this Offset Management Plan, and in the manner outlined in Section 8.

Signed
Full Name
Position
Organisation
Date

1. Introduction

Saunders Havill (SH) have prepared an Offset Management Plan (OMP) on behalf of the proponent (HB QLD Pty Ltd) to be implemented by the offset provider (Auvergne Investments) in accordance with the Preliminary Documentation Request provided for EPBC Application 2024/09865. The proposed action is for impacts to *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox) habitat to facilitate a residential development at 187-197 Binnies Road, Ripley, QLD. The action was referred under the EPBC Act on 26 April 2024 and declared a "Controlled Action" on 5 July 2024 by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), requiring assessment by "Preliminary Documentation" pursuant to section 18 and 18A (EPBC 2025/10110).

The impact area is a total of 7.52 hectares (ha) inclusive of 7.38 ha of Matters of National Environmental Significance (MNES) habitat for the Koala and Grey-headed Flying-fox (GHFF). The OMP includes the dedication and rehabilitation of 25 ha of single site offset solution (the 'Mount View Offset Area'). The Mount View Offset Area (MVOA), located as part of Lot 23 on RP47247 at Oaky Scrub Road, Oaky Creek, Queensland, 4285, will deliver overall 'conservation gain' for Koala and GHFF. The MVOA forms part of the Mount View Offset Property (MVOP) which adjoins remnant vegetation and is intended to provide multiple Federal offsets for Koala and other species. The MVOA as proposed will acquit the required impacts and provide additional benefit for the species. Details of the MVOA are provided in **Section 4**.

1.1. 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 GHFF. The plan must include (but is not limited to):

i. the ecological outcomes of the MVOA (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;

iv. detail contingency measures to be implemented if some or all of the specified are not achieved.

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 Scenic Rim Regional Council declaring the covenant, 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

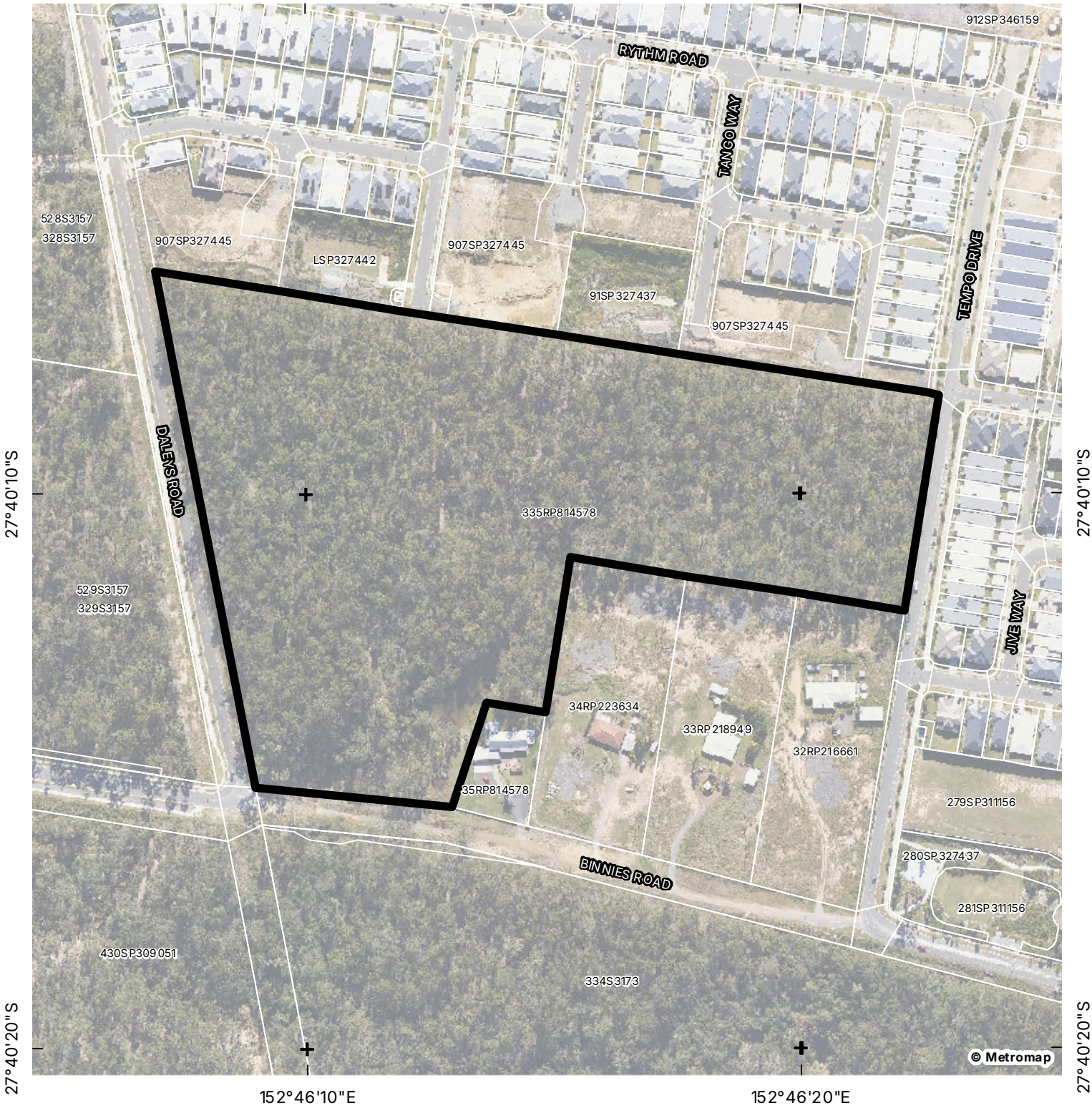
Role	Nominated person	Company/Entity	Contact details
Proponent/Approval Holder	Peter Johnson	HB QLD Pty Ltd	pj@hbland.com.au
Offset Provider	Tim McKinnon	Auvergne Investments	admin@tampastoralcompany.com.au
Administering Authority	NA	DCCEEW Compliance Monitoring Branch	EPBCMonitoring@dcceew.gov.au
Suitably 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 proposed action is for residential development on 7.52 ha of land located at 187-197 Binnies Road, Ripley (Lot 335 on RP814578). The referral area is located in a broad landscape that has been subject to extensive historical and contemporary modification. Historically, the surrounding area was used for rural land uses with major roads and high-density developments occurring from 1982. The existing land use of the referral area as vacant bushland is proposed to be changed to residential development as per the planning intent of the region (refer **Figure 1**). The referral area is mapped predominantly as Category B (remnant) vegetation containing RE 12.9-10.2 as well as a small area of Category C (high-value regrowth) vegetation containing composite RE 12.9-10.2/12.9-10.7/12.9-10.16. Of the 7.52 ha of vegetation within the referral area, 7.38 ha is considered critical habitat for Koala and potential foraging habitat for GHFF (refer **Plan 1** and **Plan 2**).

The referral area is located within the north-western portion of the Queensland Government's Ripley Valley Priority Development Area (RVPDA), approximately 6 kilometres (km) south-east of Ipswich Town Centre, 1.2 km north of the Centenary Highway and 1 km south of the Cunningham Highway (refer **Figure 2**). The RVPDA is supported by significant Queensland Government investment in roads, sewer and water purposefully designed to enable projects to commence and alleviate housing pressure in the South-East Queensland region. Under the RVPDA the site and surrounding landscape is zoned for 'urban living' under the RVPDA, which the proposed action aligns with. As such, following the designation of the RVPDA in 2011, a significant amount of development has occurred within the immediate vicinity of the referral area.



LEGEND

- Qld DCDB
- Impact Site

FIGURE 1

IMPACT SITE AERIAL

CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:3,000

0 20 40 60 80 100 m

N

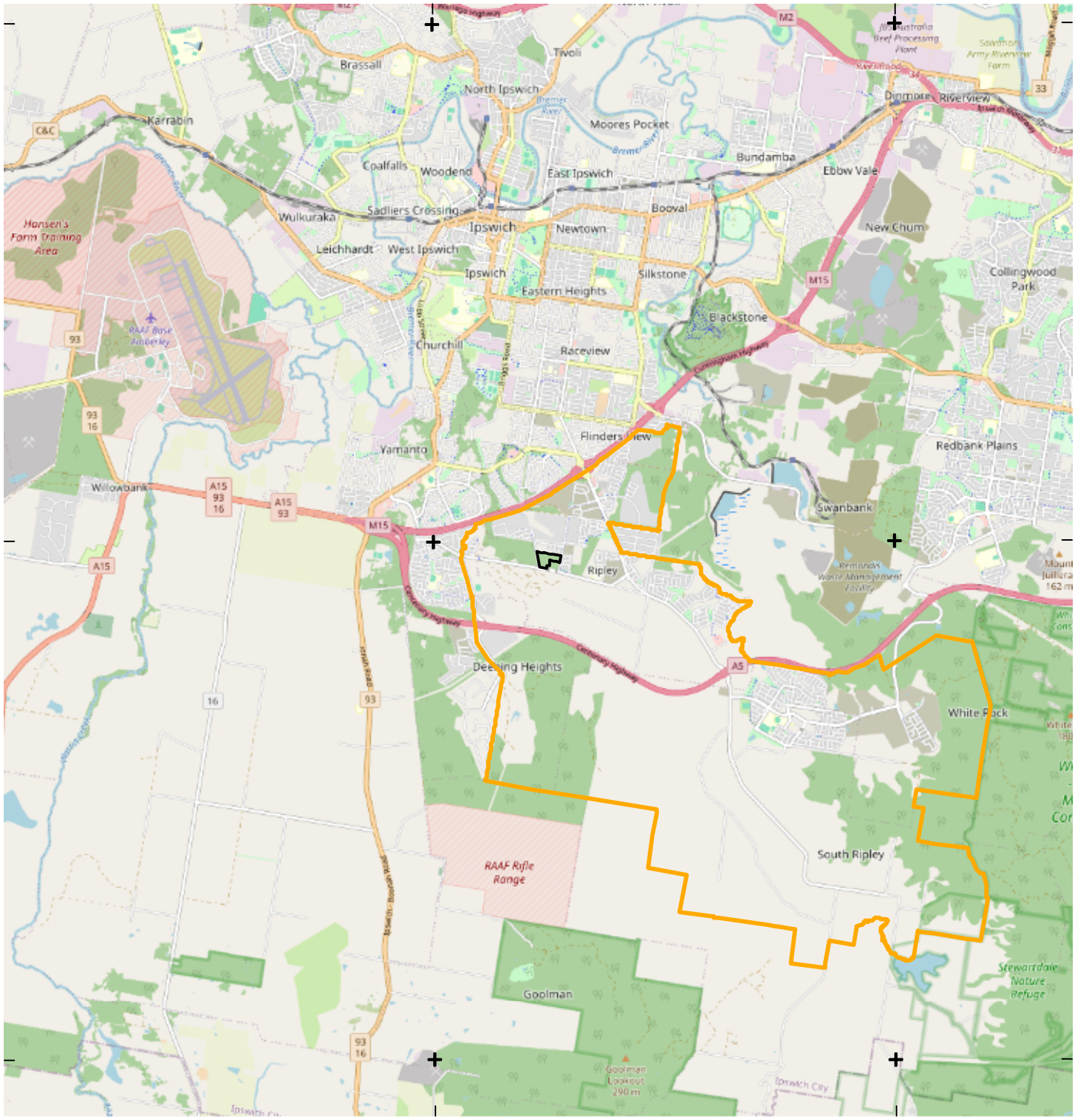
Saunders Havill
BOWEN HILLS | SPRINGFIELD
1300 123 744
mail@saundershavill.com

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FILE REFERENCE
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DATE 17/10/2025



LEGEND

- Impact Site
- Ripley Valley PDA Boundary

FIGURE 2

IMPACT SITE CONTEXT

CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:100,000

0 1 2 3 km

N

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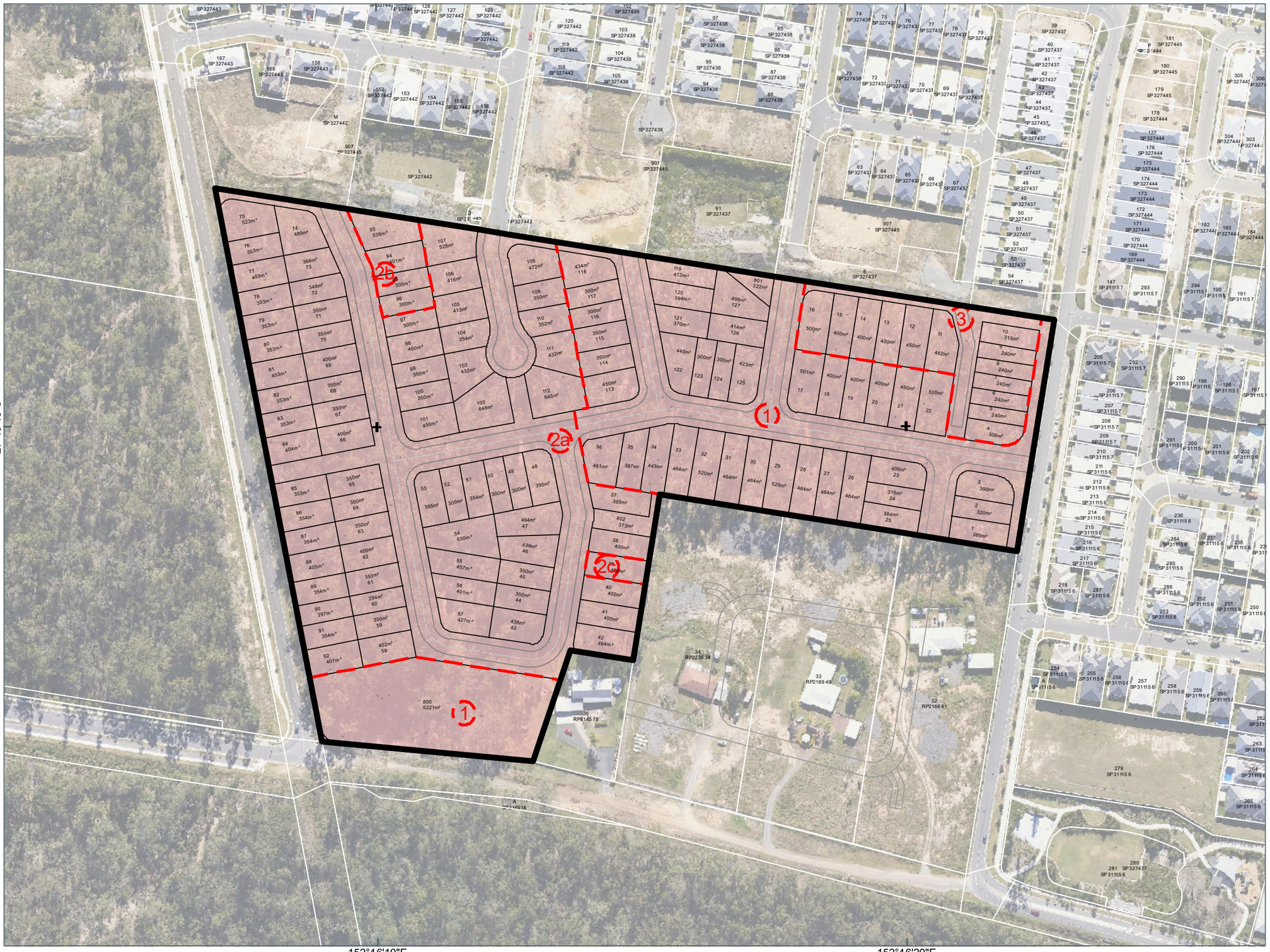
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FILE REFERENCE
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DATE 17/10/2025

01. REFERRAL AREA IMPACT



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Layer Sources
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/
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LEGEND

- Qld DCDB
- Impact site
- Impact area [7.5 ha]

Layout Detail (indicative)

- Lot Design
- Road Design
- Stage Boundary



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BINNIES ROAD, RIPLEY

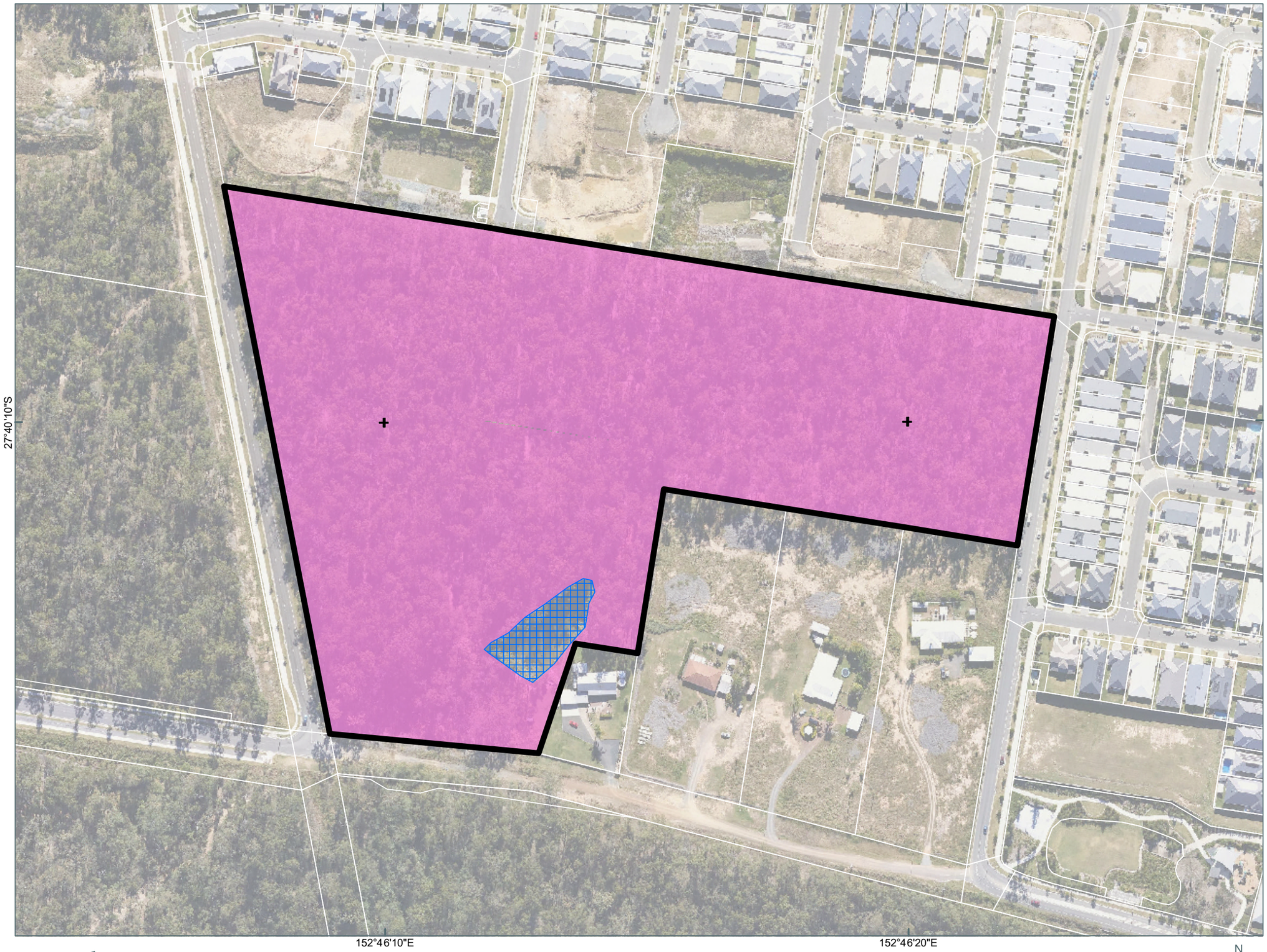
0 10 20 30 40 50 m
Transverse Mercator
GDA 2020 | Zone 56
1:2,000 @ A3

Address / RPD: Binnies Road, Ripley

17/10/2025

11826 E 01 Referral Area Impact A

02. REFERRAL AREA IMPACTS TO MNES



Notes:
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Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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LEGEND

- Qld DCDB
- Impact site
- Constructed Dam [0.14 ha]
- Impacted Koala and Grey-headed Flying-fox Habitat [7.38 ha]



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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 10 20 30 40 50 m
Transverse Mercator
GDA 2020 | Zone 56
N
1:2,000
@ A3

Address / RPD: Binnies Road, Ripley

17/10/2025

11826 E 02 Referral Area MNES A

3.2. Summary of Matters Requiring Offset

The impact area involves directly impacting critical Koala and GHFF habitat. The OMP proposes land-based offsets for the following MNES species that will be subject to significant residual impacts due to the project:

- Koala – due to unavoidable impacts to 7.38 ha of habitat critical to the survival of the species
- GHFF – due to unavoidable impacts to 7.38 ha of potential foraging habitat for the species

The impact area contains a single Assessment Unit (AU) as identified during field surveys and detailed in **Section 3.3** of the Preliminary Documentation.

Table 2: Impact area - summary of Koala assessment units and MHQA transects

Assessment unit	Vegetation community	Impact area (ha)	MNES habitat
AU1	RE 12.9-10.2	7.38	Koala/GHFF

3.3. Habitat Quality Scoring Methods

3.3.1 Koala – Modified Habitat Quality Assessment

The quantum and quality of habitat for the Koala within the impact area was 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 (herein referred to as the 'Habitat Quality Guideline'). This assessment approach utilises the Site Condition assessment method framework established under the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland* Version 2.2 February 2015 combined with site context and species stocking rate assessments to determine the habitat quality of the impact area. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to MNES.

The traditional terrestrial habitat quality assessment assesses three (3) core indicators:

1. Site Condition – a general condition assessment of vegetation compared to a benchmark;
2. Site Context – an analysis of the site in relation to the surrounding environment; and
3. Species Habitat Index – the ability of the site to support a species.

The MHQA for Koala combines the three (3) core indicators into two (2) (Site Condition and Site Context), with each attributed an equal weighting of 30% of the final score. The balance of the weighting (40%) has been attributed to the third indicator, Species Stocking Rate (SSR), which is independent of the traditional habitat quality assessment. The SSR has been added to the MHQA to better incorporate MNES, and for the purpose of this project, the endangered-listed Koala MNES. The following subsections detail the methodology utilised to assess the Site Condition, site context, and species stocking rate under the MHQA.

3.3.1.1 Site Condition (30%)

Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset site 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 expected range for a relatively undisturbed community.

The site condition assessment under the MHQA is assessed using 15 condition characteristics. Each condition characteristic and the relevant scoring and benchmark percentage is provided in **Table 3**. Attributes for the quality and availability of foraging and shelter habitat are scored differently to the biocondition manual in the MHQA therefore are detailed in the following section.

Table 3: Koala site condition scoring attributes (BioCondition Version 1.2)

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

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).

To reflect the importance of food trees to koala habitat, the quality and availability of foraging habitat has been assessed using two parameters:

- Abundance of koala food trees
- 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.

All koala food trees (eucalypt, corymbia and angophora species) with a DBH >100mm were counted within a 100m x 20m plot at each habitat transect to estimate abundance. 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 stratums, only the T1 and T2 stratums have been utilised as the T3 stratum is likely to be considered part of the understorey. 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 site condition assessment provides an accurate estimate of food source availability, and if anything would overestimate food availability giving a conservative baseline score. Canopy cover has been averaged and compared to the benchmark for the regional ecosystem. A score out of 2 has been calculated 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 10 for quality and availability of food sources. For the purposes of the MHQA condition assessment, scores will be categorised as follows:

- 0-2.99/10 will be given a 1 in the MHQA
- 3-6.99/10 will be given a 5 in the MHQA
- 7-10/10 will be given a 10 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 with a range of ancillary species used as long as they are near a food source. Trees selected are often larger with a DBH 0f 30cm – 60cm. Two parameters have been used to assess shelter habitat values at the impact and offset sites:

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

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 in the assessment is 60% for shelter tree abundance and 40% for large trees.

All shelter trees with a DBH >100mm were counted within a 100m x 20m plot at each MHQA transect completed at the impact and offset sites to estimate abundance. 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 stratums, only the T1 and T2 stratums have been utilised as the T3 stratum is likely to be considered part of the understorey. A score out of 6 calculated as follows:

- <1% – 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 shelter trees are counted over a 100m x 50m plot at each MHQA transect completed at the impact and offset sites to estimate abundance of large trees. The count is multiplied by 2 to produce a density per hectare which is averaged across the assessment unit and compared to the benchmark for the regional ecosystem. A score out of 4 is calculated as follows:

- <1% – 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 will be categorised as follows:

- 0-2.99/10 will be given a 1 in the MHQA
- 3-6.99/10 will be given a 5 in the MHQA
- 7-10/10 will be given a 10 in the MHQA

3.3.1.2 Site Context (30%)

The site context assessment considers the landscape characteristics adjoining the site. 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 MHQA, site context is measured using seven characteristics. In developing the MHQA, three species habitat index characteristics were nominated to form part of the site context characteristics: role of site location to overall species population in the state and, threats to the species, and species mobility capacity. The seven characteristics are listed below with details of how each are measured in accordance with the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (version 1.2).

Size of patch

Measured as the area of vegetation in which the assessment unit(s) is contained, and add on all other directly connecting areas of 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. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors).

Connectedness and Context

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

The context score is calculated by 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.

Unlike the traditional habitat quality assessment methodology where site connectedness and context are assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Koala habitat. While remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas 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 was determined 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 EPBC 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 assessment scale for EPBC Act referrals.

Ecological corridors

This attribute is as per the methods of the Guide to determining terrestrial habitat quality V1.2 and 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 remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, for example, Koala, this is not their primary function when assessing the attribute. An 'ecological corridor' is represented as any 'Riparian' or 'Terrestrial' feature within the 'CORR_TYPE' attribute table of the 'Queensland biodiversity and vegetation offsets special features' map. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.

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.

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 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 was applied to determine threats to species:

- 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).

Species mobility capacity

Species mobility is scored based on the presence and severity of factors that would contribute to a reduction in the mobility of the species. This can include 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 below:

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 Guideline 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 40m 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 the table below.

Potential Severity	Impediment	Primary Effect on Mobility	References
Severe	Habitat Loss & Fragmentation	Isolates habitat patches; reduces canopy connectivity; forces ground travel. The site must be isolated from any other vegetation cleared land with uses incompatible to koala movement.	Rhodes et al. 2006 McAlpine et al. 2006 Youngentob 2021
Severe	Roads & Vehicle Traffic	Roads act as hard physical barriers; vehicle strikes kill dispersing koalas. Dual lane or high trafficked roads with no or limited koala movement features such as underpasses are considered a high barrier to dispersal.	Rhodes et al. 2006 Lunney et al. 2002
Highly	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
Highly	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
Moderate	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)
Moderate	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

Potential severity assumes a 'worst case' scenario and site-specific conditions need to be considered for the assessment. For example, a rural property surrounded by barbed wire fencing with small infrastructure littered throughout the property may only provide a moderate impediment to koala movement whereas residential areas with a mosaic of timber and colour bond fencing site would be considered a high or severe impediment.



Species mobility capacity is calculated using the following method:

- 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.
- Restriction in each quadrant will be allotted a percentage score based on severity as follows:
    - No or any minor restriction not listed in Table 2 – 0%
    - Any moderate restriction as listed in Table 2 – 40%
    - Any high restriction as listed in Table 2 – 65%
    - Any severe restriction as listed in Table 2 – 90%

The restriction percentages for each quadrant are added together and divided by 4 to obtain an overall reduction in mobility for the site. A score is then allotted according to the mobility restriction severity scoring from the Guide to Determining Terrestrial Habitat Quality version 1.2. Scoring attributes extracted from the Habitat Quality Guideline are provided in **Table 4**.

Table 4: Koala site context scoring attributes

Site context attribute	*Scoring and benchmark percentage*				
Size of patch	0	2	5	7	10
	<5 ha	5-25 ha	26-100 ha	101-200 ha	>200 ha
Connectedness	0	2	4		5
	0-10%	>10-<50%	50-75%		>75% or >500 ha
Context	0	2	4		5
	<10% habitat	>10-30% habitat	>30-75% habitat		>75% habitat
Ecological corridors	0	4	6		
	Not within	Sharing a common boundary	Within (whole or part)		
Role of the site location to species overall population in the state	1	4	5		
	Not or unlikely to be critical to survival of the koala	Likely to be critical to survival of the koala	Critical to the survival of the koala		
Threats to the species	1	7	15		
	High threat level	Moderate threat level	Low threat level		
Species mobility capacity	1	4	7	10	
	Severely restricted (76-100% reduction)	High restricted (51-75% reduction)	Moderately restricted (26-50% reduction)	Minor restriction (0-25% reduction)	

3.3.1.3 Species Stocking Rate (40%)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. 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 – whether or not evidence of Koala has been recorded within or adjoining the site. Evidence may be direct in the form of observation of Koalas, or indirect via the presence of scats.
- Species usage of the site (habitat type and evidenced usage) – the type of habitat includes vegetation structure such as whether it contains remnant, regrowth or non-remnant vegetation values, and evidenced usage is the confirmed presence or use of the species within the habitat. Both factors are used to inform the species usage of the site. Depending on the level of variability in vegetation and usage patterns across the site, this characteristic may be scored differently for assessment units that reflects significant differences in vegetation value.
- Approximate density of the species on the site – measured through the use of Spot Assessment Technique (SAT) (Phillips and Callaghan 2011) and targeted searches with a high probability of detection. The combination of methods produces a higher reliability of data when extrapolating koala density. The SAT method is described in detail below, but is an industry recognised technique for identifying presence/absence of koala and measuring activity.
- 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 5** outlines the attributes utilised to assess species stocking rate.

Baseline Koala presence surveys (SATs)

Koala presence and activity levels were determined through utilising SATs (Phillips and Callaghan 2011). The SAT method is an industry recognised technique for identifying presence/absence, density and habitat usage of Koala at a site and is specified as an appropriate survey method in the former *EPBC Act Referral Guidelines for the Vulnerable Koala*. SATs are also addressed in the Australian National University's *A review of koala habitat assessment criteria and methods*.



Table 5: Koala Species Stocking Rate Scoring

Attribute	*Scoring and criteria*				
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	Score (/10)	0	5	10	
		No	Yes – adjacent to site	Yes – on-site	
Species usage of the site (habitat type and evidenced usage)	Score (/15)	0	5	10	15
		Not habitat	Dispersal habitat	Foraging habitat	Breeding habitat
Approximate density (per ha)	Score (/30)	0	10	20	30
		0%	Low	Medium	High
*Role/importance of species population on site**	Score (/15)	0	5	10	15
		0	5-15	20-35	40-45
Total SSR	/70				
SSR Score	/4				

**Species Stocking Rate supplementary table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15*			
Key source population for breeding	Score (/10)	0	10
		No	Yes/Possibly
Key source population for dispersal	Score (/5)	0	5
		No	Yes/Possibly
Necessary for maintaining genetic diversity	Score (/15)	0	15
		No	Yes/Possibly
Near the limit of the species range	Score (/15)	0	15
		No	Yes

Results from SAT surveys are compared against current available published scientific literature to identify an estimated Koala carrying capacity (SSR). SAT survey results are interpreted using the broad population categories provided in the Australian Koala Foundation Koala activity level classification table. These categories being 'East Coast (low)', 'East Coast (med-high)' and 'Western (med-high)' are shown in

Table 6 and are used to estimate Koala activity within a given area. Depending on the population category applied, Koala activity is described as 'low', 'moderate', or 'high'. Population categories are assigned as follows:

- Sites considered to be suitable or have high suitability for Koalas are assigned the 'East Coast (med-high)' category;
- Sites considered to have low suitability are assigned the 'East Coast (low)' category; and
- The 'Western (med-high)' category does not apply to South East Queensland local government areas.

Table 6: Koala activity level classification (Phillips and Callaghan 2011)

Activity	East Coast (low)	East Coast (med-high)	Western (med-high)
Low	<3.33%	<22.5%	<35.8
Moderate	3.33-12.6%	22.5-32.8%	35.8-46.7
High	>12.6%	>32.8	>46.7

The impact site was assessed under the 'East Coast (med-high)' category as is expected in areas of higher Koala density east of the Great Dividing Range (Phillips and Callaghan 2011).

As described by Phillips and Callaghan (2011) if the results of a SAT site return an activity level within the low use range, the level of use by Koala is likely to be transitory. Conversely, where a given SAT site returns an activity level within the prescribed range for medium (normal) to high use – the level of use is indicative of more sedentary ranging patterns and is thus within an area of major activity.

Scoring Weight Justification

Site condition and site context were given weighted scores out of 3, while species stocking rate was given a weighted score out of 4. Species stocking rate was given a higher weighting than condition or context as the MNES being assessed is a threatened fauna species therefore it is critical that the offset area supports individuals of that species.

Both site condition and context were given a weighted score of 3 as they are important attributes that reflect the ability of Koalas to move into the site and remain there as a healthy population. Food quality and availability are believed to be primary determinants of habitat quality for Koalas (Moore and Foley 2000) therefore site condition must provide ample food sources to provide habitat for as many individuals as possible. Recent unpublished studies completed by University of Queensland have found that Koalas spend approximately 10 minutes on the ground per day with significant preference for movement through trees (Phiddian, 2025). Therefore, connectivity of a site to surrounding vegetated areas is critical for Koala movement.

It is considered that the provision of this weighted scoring most accurately quantifies the ecological requirements of the Koala, which will then assist in determining whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset.

3.3.1.4 Summary of Impact Site Koala Habitat Assessment Outcomes

The proposed action will impact on moderate quality Koala habitat and not the species or an important population, having a total weighted impact of **6.31 (rounded to 6) out of 10**. It will result in an impact area of 7.38 ha of vegetation identified as critical habitat for the Koala. With a weighted habitat quality score rounded

to 6.00, there is an overall Quantum Impact of **4.43 ha**. Detailed MHQA results for the impact site are presented in **Appendix A.**

Table 7: MHQA final weighted score summary

MHQA Final Weighting	AU1
Site Condition /3	2.10
Site context /3	1.93
Species stocking rate /4	2.29
AU area (ha)	7.38
AU weighted score	6.31
Total weighted score	**6.31**

3.3.2 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 in 2019 in consultation with DCCEEW and utilised on several approved EPBC projects. This method adopts characteristics of the Habitat Quality Guideline while 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 these three (3) core indicators and published scientific literature into two (2) attributes, Site Condition and site context. Site Condition is weighted at 40% and site context weighted at 30% of the final score. The balance of the weighting (30%) is attributed to the third indicator, species stocking rate, which is independent of the traditional habitat quality assessment. The SRR assessment incorporated in the GHFF FHA tool focuses on 'foraging habitat' for GHFF rather than GHFF stocking rates (presence/absence of the species). This assessment of 'foraging habitat' for SSR has been incorporated in the GHFF FHA tool as GHFF roosting camp and/or species presence was not observed on-site but suitable foraging habitat was evident. Therefore, the density of foraging habitat available on-site is considered an appropriate assessment benchmark for SSR.

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

Site Condition under the GHFF FHA was assessed at the MHQA transect locations within the singular impact AU summarised in **Table 2**.

3.3.2.1 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. On-Site Condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. It is assessed 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 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.

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 8**.

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. Non-GHFF foraging species are also documented. Refer to **Table 9**.

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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 10**.

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 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 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 11**.

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 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 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 12**.

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 13**.

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 8: GHFF FHA Vegetation Condition scoring

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

Table 9: 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 10: GHFF FHA Flower Score (average) scoring

Score	Description
2	0.01 – 0.25
5	0.26 – 0.50
8	0.51 – 0.75
10	0.76 – 1.00

Table 11: 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 12: 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 13: 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

3.3.2.2 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 Habitat Quality Guideline method 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 14**.

Connectedness

This context characteristic is assessed by analysing the number of active GHFF roost camps (over the past year of monitoring) 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 **Table** 15.

Context

This context characteristic is assessed using a modified version of the Habitat Quality Guideline method 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 **Table 16**.

Ecological corridors

This context characteristic is assessed using the Habitat Quality Guideline method which involves determining the proximity of the site to state, bioregional, regional or sub-regional corridors. Refer **Table 17**.

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) 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 **Table 18**.

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 **Table 19.**

Table 14: 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 15: 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 16: 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 17: 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 18: GHFF FHA Role of Site Location to Species Overall Population in the State 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

Table 19: 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

3.3.2.3 Species Stocking Rate (30%)

The GHFF FHA incorporates species stocking rate which is an attribute not included in the Habitat Quality Guideline method. As discussed above, SSR for GHFF associated with this proposed action is related to the density of GHFF foraging habitat present at the time of the surveys. Baseline GHFF foraging tree surveys were undertaken by utilising the stem count methodology provided in 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 **Table 20** for benchmark scoring values for species stocking rate.

Table 20: GHFF Species Stocking Rate scoring

Stem density per hectare	
Score	**RE 12.9-10.2 (AU1)**
2	0 – 30
4	31 – 130
6	131 – 220
8	221 – 235
10	236 – 245
8	246 – 260
6	261 – 350
4	351 – 450
2	>451

3.3.2.4 Summary of Impact Site Grey-headed Flying-fox Habitat Assessment

The proposed action will result in an impact area of 7.38 ha of vegetation identified as critical habitat for the GHFF. With a weighted habitat quality score rounded to 7.27 (rounded to 7.00), there is an overall Quantum Impact of **5.16 ha** (refer **Table 21**). Detailed MHQA results for the impact site are presented in **Appendix A.**

Table 21: Impact area – GHFF FHA assessment results summary

MHQA Final Weighting	AU1
Site Condition /4	2.72
Site context /3	2.15
Species stocking rate /3	2.40
AU area (ha)	7.38
AU weighted score	7.27
Total weighted score	**7.27**

3.4. Impact Assessment Summary

The overall habitat quality scores for Koala and GHFF at the impact area are presented in **Table 22** and **Table 23**.

As per the EPBC Act Application (EPBC 2024/09865), the action proposes to impact 7.38 ha of Koala habitat and GHFF foraging habitat with an MHQA score of 6.31 (rounded to 6) for Koala and 7.27 (rounded to 7) for GHFF. This results in a quantum of impact of 4.43 ha for the Koala and 5.16 ha for the GHFF. Detailed impact scoring table for Koala and GHFF are provided as **Appendix A**.

Table 22: Impact area – Total MHQA results for Koala

MHQA Final Weighting	AU1
Site Condition /3	2.10
Site context /3	1.93
Species stocking rate /4	2.29
Total impact area (ha)	**7.38**
Total weighted score	**6.31 (rounded to 6)**

Table 23: Impact area – Total FHA assessment results for GHFF

MHQA Final Weighting	AU1
Site Condition /4	2.72
Site context /3	2.15
Species stocking rate /3	2.40
Total area (ha)	**7.38**
Total score	**7.27 (rounded to 7)**

4. Overview of Offset Area

4.1. Offset Property Description and Tenure

The MVOA is located at Oaky Scrub Road, Oaky Creek, Queensland within the Scenic Rim Regional Council (SRRC) Local Government Area, approximately 5.3 km east of Rathdowney and 59.15 km south of the impact area. The MVOA comprises 25 ha within Lot 23 on RP47247 and is part of the larger MVOP which is intended to provide multiple other future Federal Offsets for Koala and other MNES. MVOA aerial and context are provided as **Figure 3** and **Figure 4**.

The MVOA is zoned as Rural under the SRRC Planning Scheme. Key details relating to the MVOA are provided in **Table 24**.

Table 24: Mount View Offset Area summary

Address	**Oaky Scrub Road, Oaky Creek, Queensland, 4285**
Lot/Plan	Part of Lot 23 on RP47247
Area (ha)	25
Tenure	Freehold
Local Government Area	Scenic Rim Regional Council
Zoning	Rural

The MVOA is currently intensively grazed with slashing and burning utilised to promote pasture grasses across the entire MVOP. Much of the area is highly disturbed by grazing activities and is dominated by cleared paddock with patches of retained regrowth eucalypt vegetation predominantly restricted to a waterway, Dip Gully, in the east of the MVOA (refer **Plan 3**). In addition to cleared grazing areas, the northern portion of the MVOA was observed to contain cropping land for cattle fodder. Dip Gully in the east of the MVOA is the driving factor behind land zone 3 being mapped within the area, however on-ground assessments found differentiation between land zone 3 and land zone 8 to unclear due to the high modification of vegetation and erosion of topsoils with land representing co-alluvial processes. Although Dip Gully retains the highest levels of vegetation within the offset area, disturbance is still significant with vehicle tracks and fencing intersecting this feature.

Weed presence within the MVOA is patchy, with some dense *Lantana camara* (Lantana) infestation through the gullies and main waterway, and exotic grasses including restricted invasive species present throughout paddocks. Land management practices including prescribed burns, spraying and slashing were observed to have been consistently utilised, and continue to be employed to promote pasture grasses and improve grazing

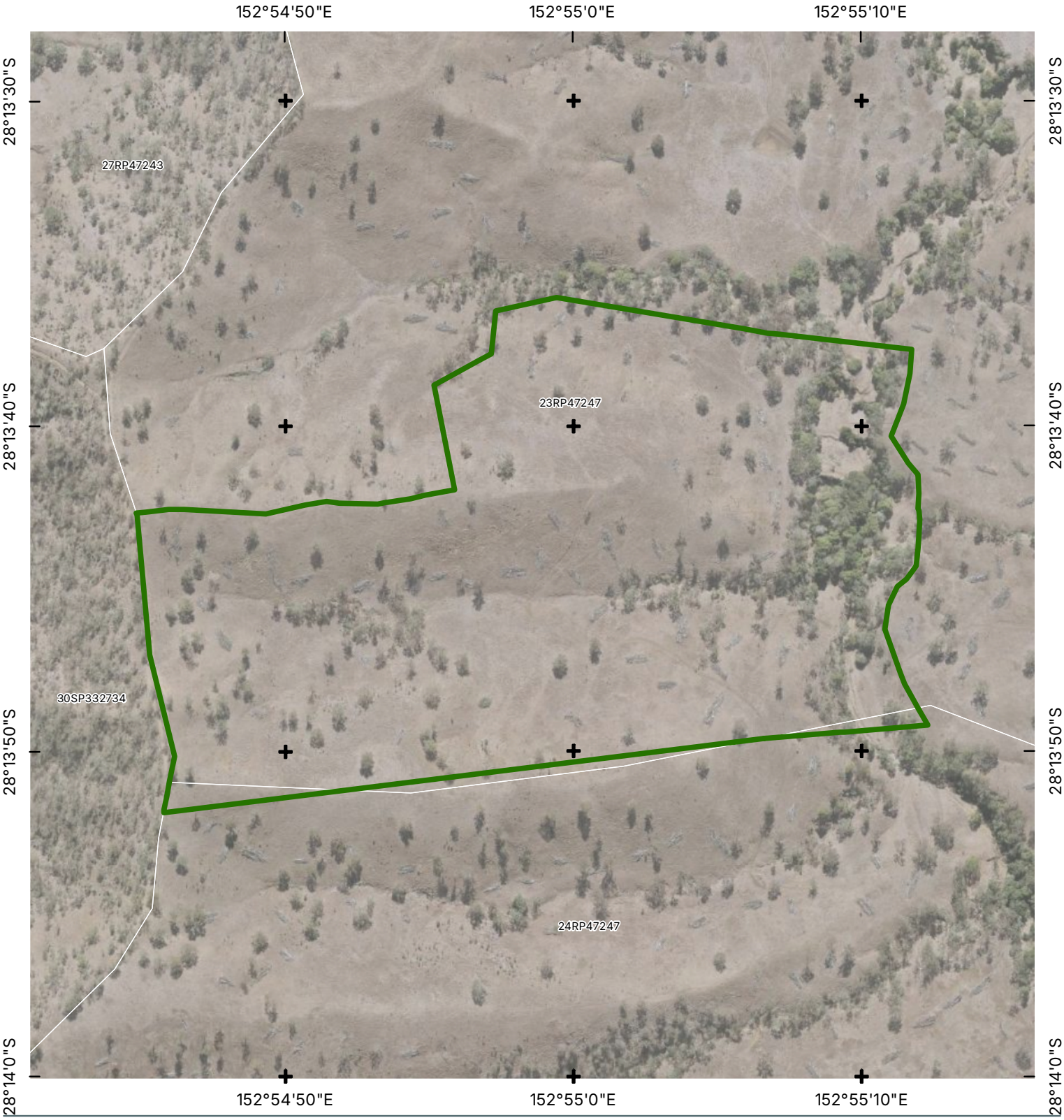
potential. This continued maintenance of the land has resulted in absent understorey and limited regrowth vegetation.

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 (**Plan 4**). This review observed expected patterns of extensive clearing and maintenance of the vegetation for rural purposes since 1955. Since this point, native vegetation growth within MVOA has generally been minimal and restricted to gullies and the main waterway, as it is currently, with slight fluctuations of growth and clearing over time. Regarding topography, the MVOA is largely undulating, with hills and gullies throughout. The eastern portion of the MVOA contains a sharp decent and ascent though the main waterway.

The MVOA is considered to have the capacity to meet the offset requirements and deliver overall conservation gains for Koala and GHFF. The MVOA is well-connected to existing habitat for these species, with the wider MVOP being partially located within both a Regional Biodiversity and State Significant corridor that connect to large nearby national parks such as the Border Ranges NP, Lamington NP, and Mt Barney NP (**Plan 8**). These areas contain contemporary records of MNES species and large area of contiguous habitat. The surrounding area also contains records of both MNES species, and so utilisation of the MVOA once revegetated is likely.

Improvement of the potential habitat within the MVOA to increase quality, quantity, and accessibility for these species is also achievable since the mixture of existing regrowth and non-remnant vegetation means it can act as a receiving area for both habitat rehabilitation and creation. Furthermore, the surrounding MVOP area contains a mix of remnant, regrowth and non-remnant vegetation that is proposed to be utilised as offset land for separate EPBC projects. These areas will undergo similar management and maintenance as the MVOA, ultimately uplifting area as a whole and providing well linked fauna habitat. As such, the proposed MVOA provides well-connected potential habitat for the impacted MNES at various states of degradation through an area known to contain the target species, and its management will allow for a conservation gain for both.

Upon EPBC Act Approval, the MVOA will be protected by a Voluntary Declaration under the *Vegetation Management Act 1999* which will provide protection for the duration of the impact. A covenant will also be completed under the *Land Act 1994* or *Land Titles Act 1994* within 12 months of commencement of the action. If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW. An assessment of the suitability of the MVOA is provided in **Section 5**.



LEGEND

- Qld DCDB
- Offset Area

FIGURE 3

OFFSET SITE AERIAL

CLIENT
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PROJECT
BINNIES ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:5,000

0 50 100 150 200 m

N

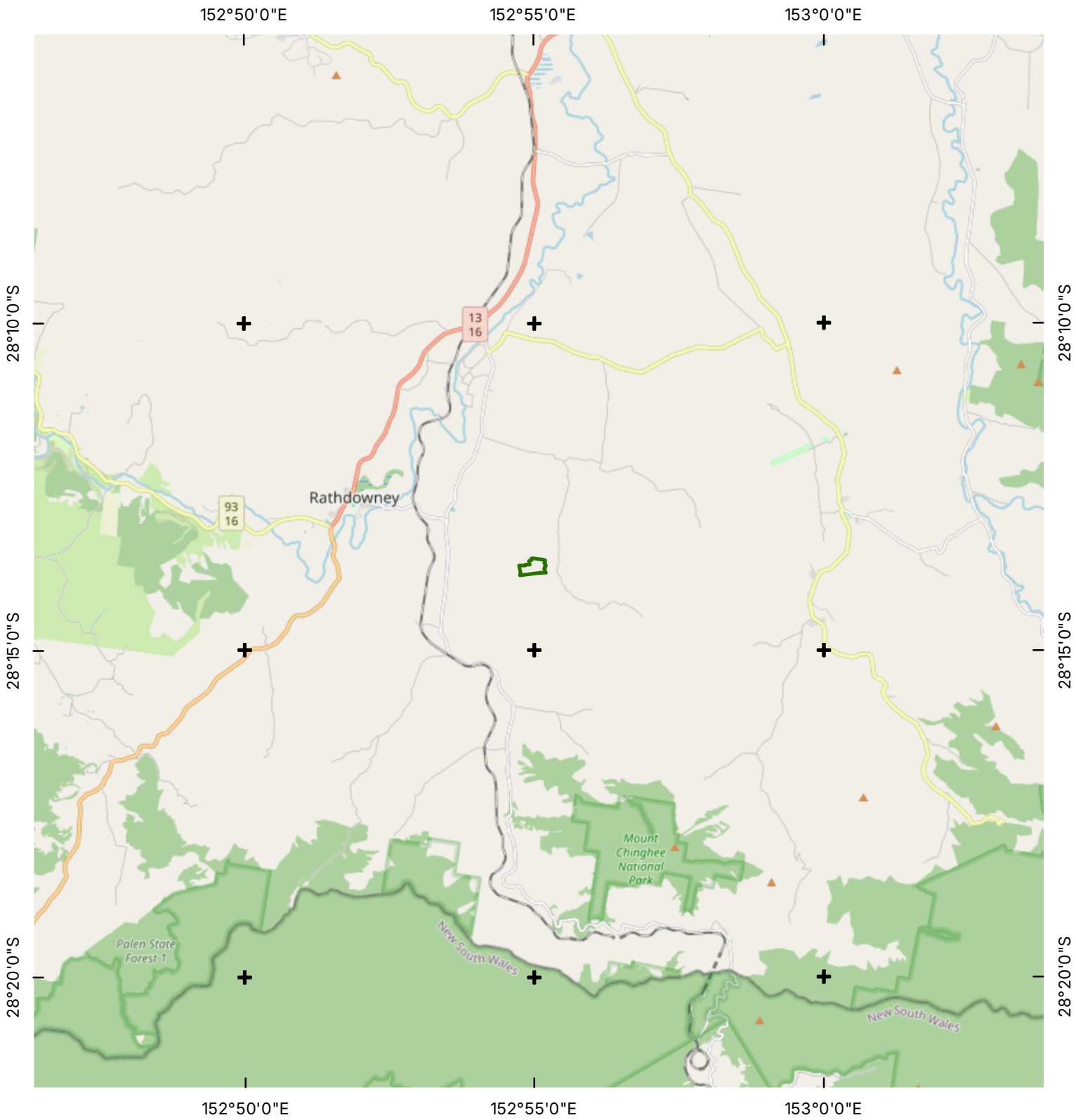
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11826 E Figure 3 Off Site Aerial A

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LEGEND

Offset Area

FIGURE 4

OFFSET SITE CONTEXT

CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD, RIPLEY

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:150,000

0 1 2 3 4 5 km

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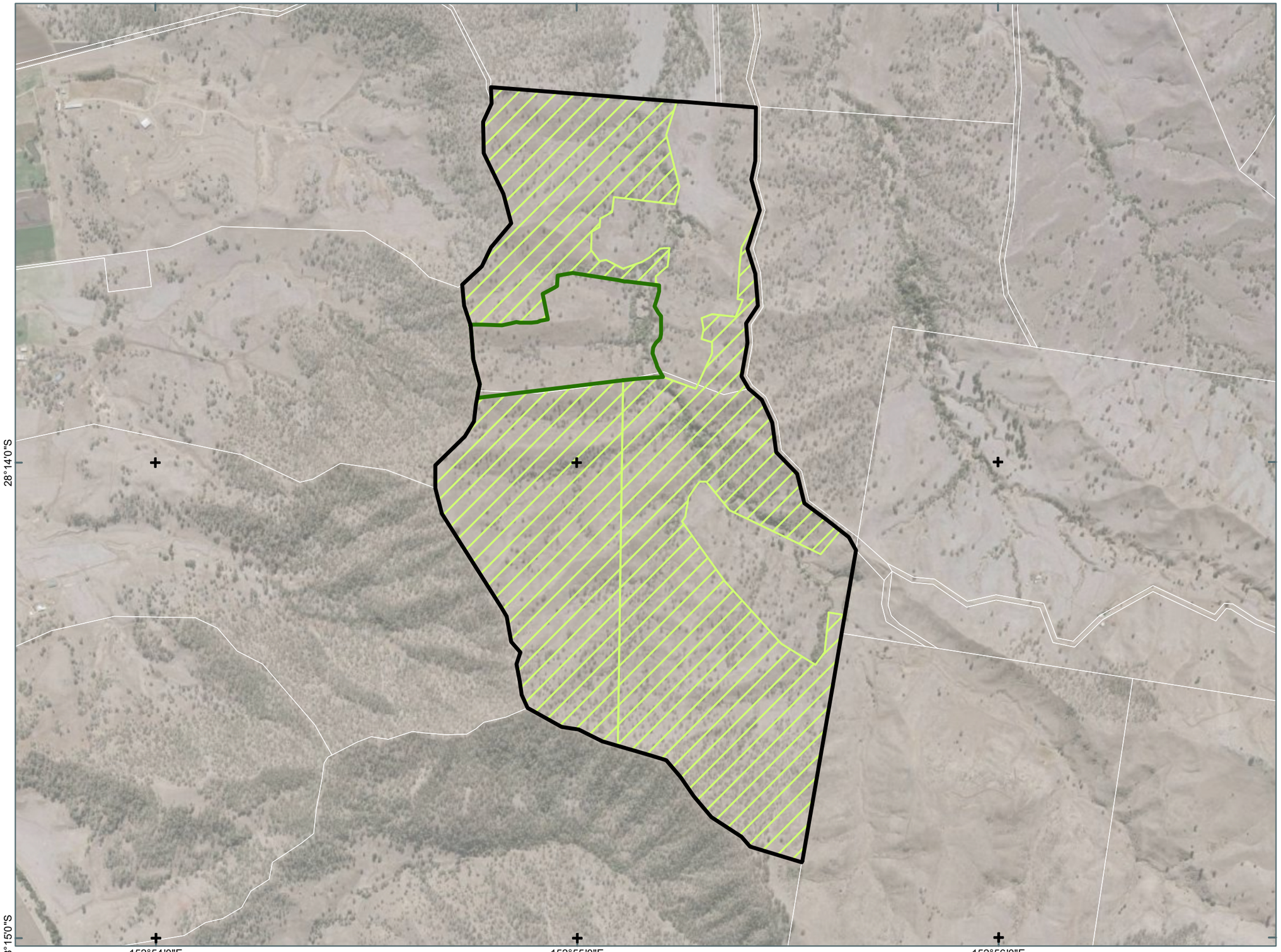
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03. OFFSET AREA



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- Qld DCDB
- Mount View offset property [314.7 ha]
- Offset area [25 ha]
- Potential future offsets



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0 100 200 300 400 500 m

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Transverse Mercator
GDA 2020 | Zone 56

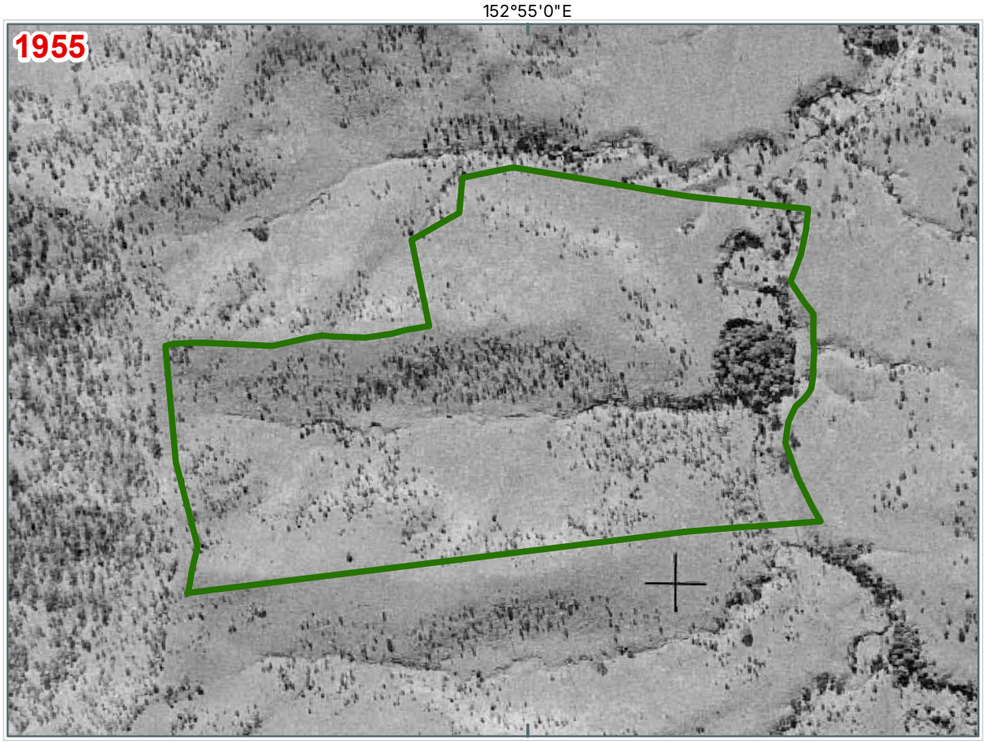
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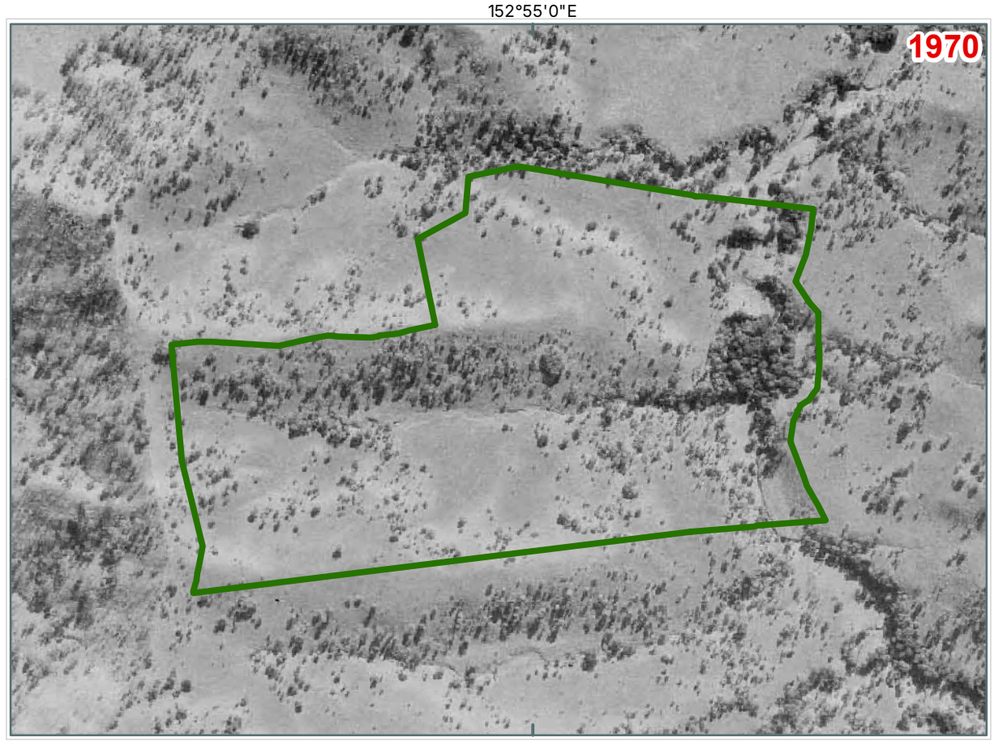
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11826 E 06 Offset Area A

04. OFFSET AREA HISTORICAL AERIAL IMAGERY









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11826 E 07 Offset Historical A

5. Offset Area Suitability

As detailed in **Section 1**, one offset area (MVOA) has been selected to be secured to wholly acquit the impacts to MNES outlined under the EPBC Preliminary Documentation (EPBC 2024/09865) and provide benefit additional to the required compensation for residual impacts.

The suitability of the MVOA for providing habitat for Koala and GHFF is discussed within this section including the bioregional context, habitat values, current land management practices and threats.

5.1. Bioregional Context

Queensland is divided into 13 biogeographical areas to identify biodiversity features at a regional scale. The MVOA is located in the South East Queensland (SEQ) Bioregion. The SEQ Bioregion extends from the Border Ranges on the New South Wales border, north to the dry coastal corridor between Gladstone and Rockhampton (DEHP 2016). It shares its western boundary with the Brigalow Belt Bioregion. The McPherson Range borders the southern boundary, and the Great Dividing Range the west of the bioregion. 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). Both the impact area and MVOA occur within the SEQ bioregion and occur within adjoining sub-bioregions. The impact area occurs within the Moreton Basin sub-bioregion and the MVOA occurs a few kilometres south Moreton Basin sub-bioregion boundary within the Scenic Rim sub-bioregion.

5.2. Habitat Values

5.2.1 Regional and Landscape Context

The MVOA occurs adjacent the Biodiversity Planning Assessment State corridor and South East Queensland Regional Plan ('ShapingSEQ 2017') Regional Biodiversity Corridor, with the wider MVOP occurring within both of these corridors. The South East Queensland Regional Plan Regional Biodiversity Corridor spans from the Noosa headland in the north, down to Mount Barney and Lamington National Park on the Queensland border (**Plan 5**). 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).

Vegetation patches within the MVOA connect through to these corridors. Through being utilised as an offset area, the MVOA will conserve freehold land adjoining the regional biodiversity corridor, ultimately improving linkages to large patches of vegetation and habitat for MNES. This linkage provides a valuable contiguous habitat

corridor, ensuring habitat fragmentation is minimised and improving the connectivity of Koala habitat within SEQ, contributing to the future protection and persistence of the species.

The MVOA 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 and GHFF habitat in the region. By improving potential habitat on site via 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 site. This aligns with offset principle 1 of the EPBC Act Environmental Offsets Policy (EOP) that states *Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matter*.

The broader MVOP is intended to support future EPBC offsets meaning that the MVOA will combine with additional offset areas to form a more than 250 ha patch of suitable, well-connected habitat that directly connects to Local and Regional biodiversity corridors.

5.2.2 Topography

Topography within the MVOA is varied, with defined gullies, most notably Dip Gully in the east, and undulating hills intersecting the broader site (**Plan 6**Error! Reference source not found.). The western boundary of the wider MVOP aligns with the ridge of a small mountain range, so the land and gullies generally slope east towards Dip Gully, located just off-site. The MVOA ranges from almost 150 m Above Sea Level (ASL) associated with the waterway in the east to approximately 225 m ASL in the west.

5.2.3 Water Resources

The MVOA contains one (1) waterway as mapped under the Queensland *Fisheries Act 1994*. This is Dip Gully which runs south to north along the eastern boundary of the MVOA. This watercourse is also mapped as a VMA stream order 2 watercourse however is not mapped as a feature under the *Water Act 2000*.

5.2.4 Koala and Grey-headed Flying-fox Habitat

Field surveys determined the MVOA is dominated by cleared grazing areas and cropping land, with patches of retained eucalypt vegetation occurring in association with Dip Creek and its gully line tributaries in the east of the site. Vegetation remaining within the MVOA is comprised largely of regrowth and scattered large trees through open grazing paddocks. The regrowth vegetation contains a higher diversity of eucalypt species and mature and regrowth eucalypt trees however the shrub and sub-canopy layers are largely absent as a result of land management activities from the property owner. Generally, invasive species presence, in particular *Lantana camara* (Lantana) are highest throughout the gully lines and in portions of Dip Creek where weed maintenance has lapsed. Pasture weeds are present across the MVOA.

Due to its long use for cattle grazing, the MVOA is largely mapped as Category X (non-remnant) vegetation under the VMA. Where Category C vegetation is present, this is mapped as containing Of Concern composite RE 12.8.17/12.8.16/12.8.14 (50/30/20%) west of Dip Gully and Endangered composite RE 12.3.3/12.3.2/12.3.7 east of Dip Gully. Pre-clear RE mapping across the Category X (non-remnant) vegetation is also predominantly RE 12.8.17/12.8.16/12.8.14, with small areas of RE 12.3.3/12.3.2/12.3.7 adjacent the main waterway. Descriptions for these REs are provided in **Table 25**.

05. OFFSET AREA ECOLOGICAL CORRIDORS



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LEGEND

- Offset area
- SEQ Regional Plan 2017 Regional Biodiversity Corridor

Statewide Corridor Buffer

- Regional Significance
- State Significance



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11826 E 08 Offset Area Eco A

06. OFFSET AREA TOPOGRAPHY



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- Qld DCDB
- Offset area
- 5m Contours



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11826 E 09 Offset Area Topo A

The MVOA was delineated into three (3) separate Assessment Units based on the ground-truthed non-remnant, and regrowth vegetation communities under the MHQA methodology. Notably, all areas of the MVOA were observed to have evidence of historical clearing including mapped regrowth vegetation.

In addition, field surveys noted that the Land Zone 3 mapping was not entirely accurate with the delineation between Land Zone 3 and Land Zone 8 relatively undefined in portions. As such, on-ground surveys recorded areas Land Zone 3 encroaching further west into mapped Land Zone 8 as identified by the banks of the gully. Subsequently, the area of AU1 (HVR containing Endangered composite RE 12.3.3/12.3.2/12.3.7) appears to encompass areas of Of Concern composite RE 12.8.17/12.8.16/12.8.14, however was ground truthed to all reflect Land Zone 3 ecosystems.

Table 25: Mount View Offset Area – Regional Ecosystem descriptions

Regional Ecosystem	Vegetation structure	Description
12.3.3	Sparse	*Eucalyptus tereticornis woodland. Eucalyptus crebra and E. moluccana are sometimes present and may be relatively abundant in places, especially on edges of plains and higher-level alluvium. Other species that may be present as scattered individuals or clumps include Angophora subvelutina or A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens and E. melanophloia. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. Not a Wetland. (BVG1M: 16c).*
12.3.2	Mid-dense	*Eucalyptus grandis +/- E. microcorys, Lophostemon confertus tall open forest often with vine forest understorey ('wet sclerophyll'). Patches of Eucalyptus pilularis sometimes present especially in vicinity of sedimentary rocks (e.g. around Palmwoods). Fringing streams and in narrow gullies in high rainfall areas. Riverine. (BVG1M: 8a).*
12.3.7	Sparse	*Narrow fringing woodland of Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca viminalis. Other species associated with this RE include Melaleuca bracteata, M. trichostachya, M. linariifolia. North of Brisbane Waterhousea floribunda commonly occurs and may at times dominate this RE. Melaleuca fluviatilis occurs in this RE in the north of the bioregion. Lomandra hystrix often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region. Riverine. (BVG1M: 16a).*
12.8.17	Sparse	*Mixed woodland with combinations of Eucalyptus crebra, E. melanophloia, E. tereticornis, Corymbia tessellaris, C. intermedia, and commonly containing Angophora subvelutina and E. melliodora, with a grassy ground layer. Usually occurs on mid and lower slopes of hills on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).*
12.8.16	Sparse	*Eucalyptus crebra, generally with E. melliodora and E. tereticornis subsp. Basaltica grassy woodland. Eucalyptus albens may occur on the western edge of the bioregion. Usually occurs on dry mid and upper slopes and crests on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).*

Regional Ecosystem	Vegetation structure	Description
12.8.14	Mid-dense	*Eucalyptus eugenioides, E. biturbinata, E. melliodora +/- E. tereticornis, Corymbia intermedia, E. crebra open forest. Allocasuarina torulosa is a common understorey species. Localised occurrences of Eucalyptus laevopinea, E. quadrangulata and E. banksii may occur. Occurs on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).*

The presence of vegetation communities containing foraging habitat values for the Koala and GHFF suggests the MVOA provides value for these species and will continue to improve in quality and availability with targeted restoration and preservation in historically degraded areas.

5.3. Current Land Management Practices

Presently, the MVOA is utilised for cattle grazing and cropping land that is managed through various farming practices. This includes the use of the following management activities:

- Intensive grazing to ensure ground cover levels are maintained, subsoil moisture is retained, and pasture growth is encouraged.
- Targeted spraying/slashing of regrowth and weeds to encourage spread of pasture grass.
- Controlled burns to remove weeds and regrowth to promote pasture grass. Fire scar mapping shows the entire site has undergone management since 2016.
- Establishing and maintaining adequate firebreaks across the property.
- Utilisation of fencing and gates for cattle control

5.4. Current Threats

The MVOA is and has been utilised in various ways for agriculture, which attracts a range of threats to both livestock and native wildlife. Non-native vertebrate pests have been confirmed within the local region adjacent the MVOA. The Queensland WildNet database identifies records of two (2) Wild Dog (*Canis familiaris*), five (5) Red Fox (*Vulpes vulpes*), one (1) Feral Cat (*Felix catis*), and one (1) European Brown Hare (*Lepus europaeus*) within 20 km of the MVOA. Wild Dogs are known to travel up to 20 km seeking prey, with home ranges of individuals likely to overlap with the MVOA.

The SRRC lists Wild Dogs (*Canis familiaris*) as declared pest animals and runs an ongoing baiting program alongside landowners to reduce numbers. Wild Dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are considered direct threats to the MNES target species. This conclusion is based on several federal government documents including the DAWE Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory.

Additional threats to Koala and Grey-headed Flying Fox include Feral Cat (*Felix catus*) and European Red Fox (*Vulpes vulpes*). These species are not listed as a key threatening process to either of the MNES species however both are known to be opportunistic predators with significant impacts to native species.

Feral Pig (*Sus scrofa*) and European Rabbit (*Oryctilagus cuniculus*) are also known to cause significant environmental destruction to soil and vegetation through digging, spreading weeds and will be addressed through the OMPs pest management strategy.

Other general threats to habitat quality at the MVOA include:

- clearing and harvesting of timber for pastoral uses,
- ploughing and harvesting land for fodder,
- uncontrolled wildfire,
- barbed wire, and
- significant weed infestations of Weeds of National Significant (WONS) including *Lantana camara* (Lantana) and *Senecio madagascariensis* (Fireweed).

Refer to Tables 26 and 27 for a summary of threats identified at the site and **Figure 5** for an outline of how threats will be prioritised for management.

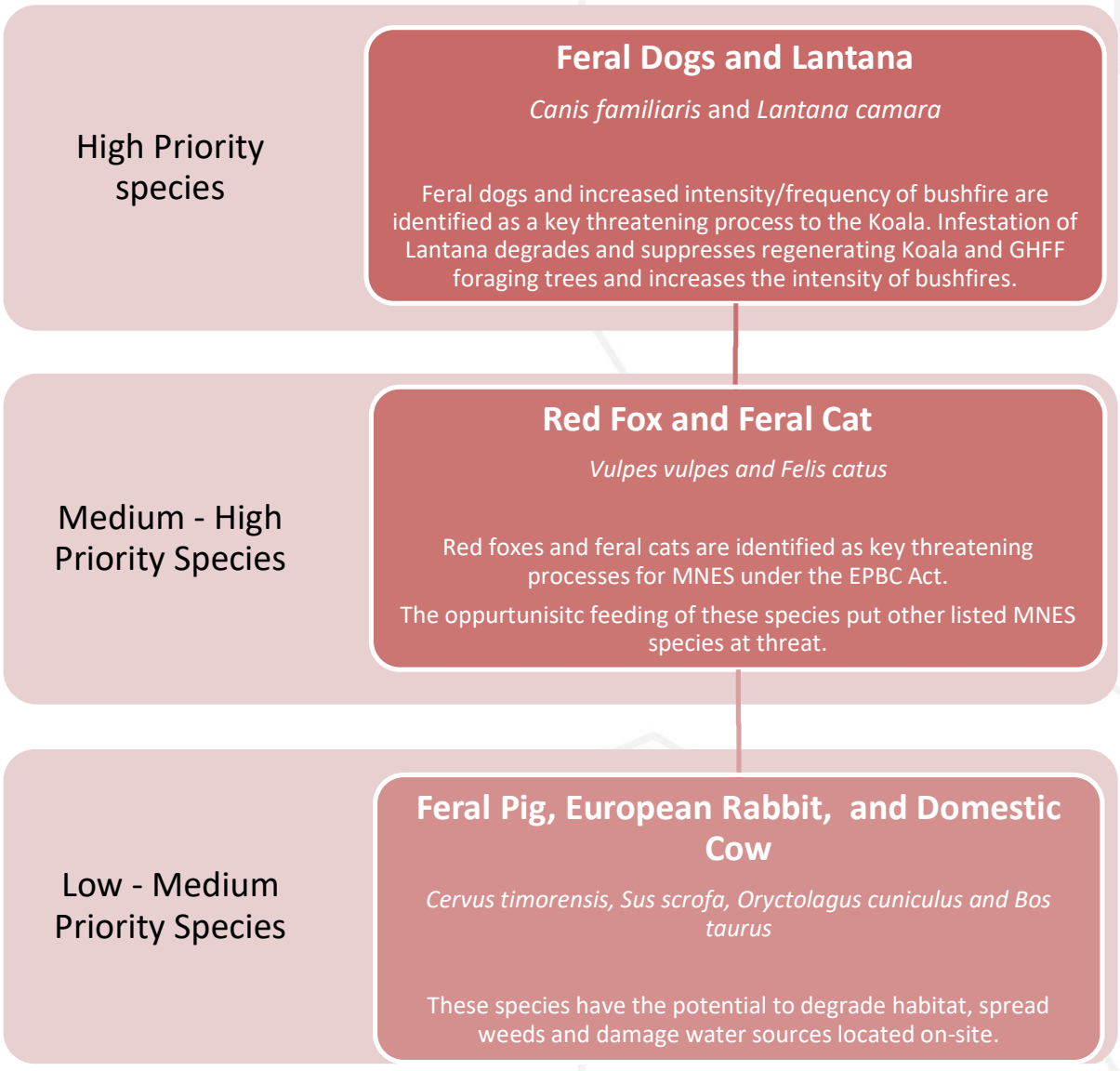
Table 26: Offset property restricted invasive matters identified as threats to MNES.

***Biosecurity Act 2014* Restricted Matter**	**Restricted Category**	**SRRC Declared Pest Animals or Weeds**
Weeds of National Significance (WONS)		
Lantana (*Lantana camara*)	3	Yes
Fireweed (*Senecio madagascariensis*)	3	Yes
Significant Invasive Fauna		
Wild Dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*)	3,4,6	Yes
Feral Cat (*Felis catus*)	3,4,5,6	Yes
Feral Pig (*Sus scrofa*)	3,4,6	Yes
European Red Fox (*Vulpes vulpes*)	3,4,5,6	Yes

Table 27: Offset property threats MNES species

MNES Offset Target Species	**Major threats to MNES present within offset property**
Koala (*Phascolarctos cinereus*)	- Encounter mortality from Wild Dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) - *Lantana camara* adversely affects the ability of Koalas to move between trees
Grey-headed Flying-fox (*Pteropus poliocephalus*)	- Barbed wire fencing (entanglement)

Figure 5:Threat Management Prioritisation



5.4.1 Weeds of National Significance

Lantana was observed in several locations across the site, in particular around the waterways and gullies. Invasion, establishment and spread of Lantana is a key threatening process to many threatened flora species and has been acknowledged to adversely affect the ability of Koala to move between trees (NSW Scientific Committee, 2021). The Department of Agriculture and Fisheries (DAF0 (2023) indicates more than 1400 native species are negatively affected by Lantana invasion, including many endangered and threatened species. Additionally, Lantana as a woody shrub with thin, combustible canes, has been observed to create hotter bushfires, which significantly alters native vegetation communities and pastures (DAF, 2023). It is noted that under the Conservation Advice for Koala, increased intensity/frequency of bushfire is a listed key threatening process. Although this largely refers to the impacts caused by Climate Change, the presence of Lantana within bushland can significantly increase the extremity of bushfire and thus the impact it has directly on Koala and other listed species such as GHFF that rely on Eucalypt bushland for foraging and breeding (refer **Figure 5**). For this reason, the Queensland Governments 'Southeast Queensland Koala Conservation Strategy 2022 – 2025' lists management of invasive weeds in both *Action Area 1: Habitat Protection* and *Action Area 3: Threat Management* (DES, 2020). Impact management of invasive flora, particularly Lantana, is therefore considered a key direct action to addressing threats on Koala and other listed species that share the same habitat requirements.

Lantana has potential to quickly colonise an area preventing movement opportunities for fauna and supressing native regrowth and is therefore considered a primary weed to be controlled.

Fireweed was also observed on site. It is a prominent weed throughout native and improved pastural land, open woodland and grassland that is abundant and conspicuous throughout much of southern Queensland. This species is listed as a Weed of National Significance (WONS) due to its invasiveness, capacity to rapidly spread, and environmental impacts. Although not listed as a direct threat or key threatening process to MNES, Fireweed is known to outcompete native species and reduce ground cover, ultimately resulting in erosion and stripping of topsoils. As such, Fireweed should be controlled to limit competition with natural regeneration of Koala and GHFF foraging trees and improve overall soil health.

5.4.2 Significant Invasive Fauna

5.4.2.1 Wild Dog

The Department of Primary Industries (DPI) lists feral dogs as abundant and widespread throughout the Scenic Rim region. Although not recorded within the MVOA during field surveys, motion-sensor fauna camera traps deployed in the wider MVOP recorded multiple Wild Dogs over the broader property (**Photo set 1**). Furthermore, anecdotal evidence from the site owners also indicates Wild Dogs have been observed within the site itself. In addition, research by Pest Animal Management QLD (2020) found that the Scenic Rim region contains an abundance of Wild Dogs, with evidence indicating that calf predation has increased significantly in the last decade.



Photo set 1: Wild Dogs recorded in the wider offset property

5.4.2.2 European Red Fox

European Red Fox is listed as a major threat to the survival of several MNES species. DAF lists foxes as being widespread across Australia due to being highly adaptable and opportunistic feeders consuming a wide variety of animal and plant material, such as rabbits, rodents, frogs, birds, insects and even fruit, vegetables and grain. Scenic Rim Regional Council also lists this species as being abundant throughout the region, with trapping programs widely conducted (SRRC 2023).

Records of this species are present within 20 km of the site. Further, under SRRCs *Biodiversity Strategy 2015 – 2025* local council has set forth an objective to support land managers in the control of pest animals, including foxes. Indicating the acknowledgement that these pest species are currently a problem in the region.

5.4.2.3 Feral Cats

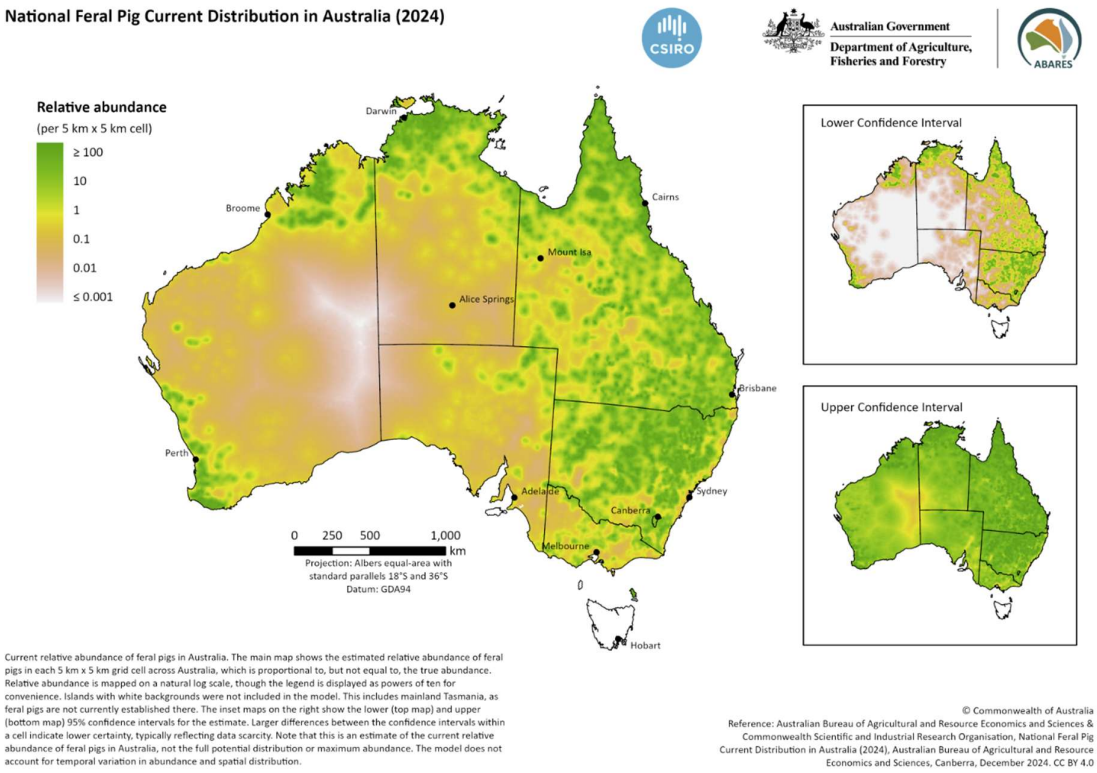
DCCEEW state that Feral Cats pose a significant threat to many nationally listed threatened species. This species is known to predate on native species, spread diseases and reduce viable habitat for species most at risk. It is recorded that they are a threat to more than 120 nationally listed threatened species and have been implicated in 28 mammal extinctions (DCCEEW, 2023). For this reason, predation by Feral Cats has been listed as a Key Threatening Process (KTP) under the *Environment Protection and Biodiversity Conservation Act 1999*. Additionally, the impacts of unabated Feral Cat predation on threatened species have resulted in this pest species being a focus point of many federal, state and local government programs, with a feral cat taskforce established by the *Threatened Species Commissioner in 2015*.

WildNet records of Feral Cats indicate they occur within 20 km of the site. Further, Scenic Rim Regional Council declare Feral Cats as a pest animal within the area with it noted that they are scattered throughout the region and trapping is an on-going activity. Additionally, research from the National Land & Water Resources Audit, Canberra indicates that Feral Cat occurrence, abundance and distribution within south-east Queensland is “common/widespread”.

5.4.2.4 Feral Pigs

Although Feral Pig (*Sus scrofa*) aren't listed as a direct threatening process to Koala or GHFF, it is acknowledged they are opportunistic omnivores and will consume a wide range of animals including small mammals and birds. Feral Pigs are also widely known to cause significant environmental destruction to soil and vegetation via digging, spreading weeds and consumption, particularly surrounding waterbodies. Therefore, the presence of Feral Pigs can cause the destruction of current habitat value and water resources and indirectly impacting essential habitat areas for the listed MNES.

Evidence of Feral Pig was not recorded within the MVOA or wider offset property however records of this species are present within 20 km of the site. In addition, CSIROs *National Feral Pig Current Distribution in Australia (2024)* modelling indicates relative abundance of Feral Pig within the SRC region to be ≥100 per a 5km x 5km area (**Extract 1**).



Extract 1: National Feral Pig Current Distribution in Australia (2024)

5.5. 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 and GHFF 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 Offset Policy

EOP Requirements **Suitable offsets must:**	**Delivery**
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the protected matter	The impact site is mapped within the north-west of the Queensland Government's RVPDA and occurs wholly within and surrounded by Urban Living zoning. Land designated within the RVPDA is supported by significant Queensland Government investment into roads, sewer, and water purposefully designed to enable projects to commence and alleviate housing pressure in the SEQ region. The entire 7.52 ha impact site is required to be cleared to facilitate residential development, inclusive of the unavoidable impact to 7.38 ha of habitat critical to the survival of Koala and 7.38 ha of potential GHFF foraging habitat. Field surveys identified vegetation across the impact area to be consistent with eucalypt woodland throughout, which could support Koala and GHFF. Despite the impact area being mapped as remnant vegetation, evidence of historical selective logging was observed resulting in relatively few mature trees than would be typical in this community. Additionally, hollow bearing trees were sparse which often form in large mature trees further indicating historical selective clearing. Further, the impact area is located in a broad landscape that has been subject to extensive historical and contemporary modification. Given the planning intent of the site and surrounding area, the ability of the impact site to provide current and future conservation outcomes for MNES is limited. The MVOA is sufficiently larger than the impact area, 25 ha, and will directly contribute to the ongoing viability of the Koala and GHFF by securing an area directly connected to environmental corridors and future offset areas, and via maintaining the vegetation within this area to improve and increase potential habitat. Protection and management of the MVOA in accordance with this OMP will improve conservation outcomes by providing a net gain in Koala and GHFF habitat. The proposed MVOA, without being secured as an offset, is not protected or managed for conservation outcomes and exists as freehold land used for pastoral grazing and rural land uses. Given the historical and ongoing use for grazing, it is unlikely land uses would change organically without this area being pursued as an EPBC MVOA, wherein the land would continue to be disturbed, providing limited viability to support populations of Koala and/or GHFF. As a result of the long-standing agricultural use, the MVOA is highly disturbed with large, cleared paddock areas and some moderately weeded areas present through gully lines. This OMP and associated management provide guidance for the regeneration and restoration of habitat, to enhance habitat values for Koala and GHFF and provide connection to the existing state significant and regional biodiversity corridors that are located within the wider offset property whilst also reducing known threats to the species. The proposed restoration and improvement of vegetation in the MVOA through increasing abundance of food trees and removing weeds to encourage natural regeneration will increase the overall area of Koala and GHFF habitat in SEQ and compensate for the loss of 7.38 ha of GHFF and Koala habitat in an urban area destined for further urbanisation. The improvement and uplift of habitat within an area proposed for other future offsets contributes to conservation



EOP Requirements Suitable offsets must:	Delivery
	outcomes by providing areas of refuge and increases resilience of these species by increasing landscape connectivity through the protection of the offset properties in perpetuity.
Be built around direct offsets but may include other compensatory measures	The MVOA is >3 times larger than the impact area and will provide a direct offset for the entire impact. The MVOA will be legally secured for conservation purposes prior to the proposed impact occurring and will endure in perpetuity. Legally securing and managing the MVOA in accordance with this OMP protects the improved habitat from incompatible land uses that ultimately contribute to the viability of Koala and GHFF.
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 1.2% and GHFF as 0.2%. This use of this measurement in the OAG ensures that the appropriate level of statutory protection is applied. All threats to Koala outlined in the Department's Species Profile and Threats Database (SPRAT) and conservation advice have been addressed within this OMP. Threats outlined in the Department's SPRAT for GHFF have been addressed within this OMP.
Be of a size and scale proportionate to the residual impacts on the protected matter	Permanent protection and management for the lifetime of the approval will deliver a conservation gain for Koala and GHFF, adequately compensating for the quantum impact on each matter of national significance. The total MVOA for protection and management is 25 ha, delivering a **106.76%** offset for Koala and a **135.81%** offset for GHFF, thus satisfying the 90% minimum direct MVOA. 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 MVOA and management actions will provide: • Legally secured and long-term protection of 25 ha of Koala habitat and GHFF foraging habitat. • Improvement of habitat through revegetation and natural regeneration of Koala food trees and GHFF foraging trees and removal of weeds. • Contribution to a large contiguous protected habitat adjacent to biodiversity corridors with reduced threats. • Long-term reduction in threats, through the removal of incompatible land uses. • Reduced risk of Koala mortality or injury due to predators, through control of non-native predators. • Reduced risk of high intensity fire through management of fuel loads. • Reduced risk of the spread of diseases and/or pathogens.
Effectively account for and manage the risks of the offset not succeeding	Confidence in the success of the offset is 85% across all Assessment Units. These confidence results are considered appropriate given the intensity of site works, use of established best practice management techniques, high level of detail provided (i.e. the detailed rehabilitation plan) and conservative outcomes used to identify uplift scores. For example, the regrowth assessment units do not predict any increase in



EOP Requirements Suitable offsets must:	Delivery
	koala stocking rate even though only one scat was identified during baseline surveys and koala density is likely to increase significantly post rehabilitation works. For the paddock assessment unit, large trees have not been included in the uplift scores even through some trees are likely to exceed the required DBH after 20 years of growth The confidence is supported by the selection of the MVOA, design of management actions, and clear monitoring and reporting procedures. The MVOA contains access tracks that will facilitate access to high priority weed treatment areas and planting areas. Non-remnant vegetation areas across the MVOA are considered to have a lower confidence level reflecting the potential risks relating to higher levels of disturbance, revegetation processes and plant stock success/failure rates, and natural events. Risks associated with the offset delivery will be mitigated and managed through the detailed management actions outlined in **Section 8**. Management actions have been drawn from offset targets which aim to protect and conserve large, connected areas of Koala and GHFF 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 MVOA 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 habitat and connectivity, destruction of habitat via hot, intense fires, or increased risk of mortality or injury by dog attack and other feral predator species.
Be efficient, effective, timely, transparent, scientifically robust, and reasonable	Efficient and Effective: • The MVOA is surrounded by a wider landscape of connected Koala habitat. Management actions will ensure efficient delivery of outcomes over the MVOA and involve proactive management, monitoring and reporting to ensure response and/or corrective actions are timely and focused. • Prior to the EPBC Act process triggering the required offsetting, the MVOA was not protected or managed for conservation outcomes. Protection and management of the MVOA in accordance with this OMP aims to deliver an overall improved conservation outcome and net gain in Koala and GHFF habitat in an area that would not have otherwise contributed to conservation outcomes for the species. Timely: • The mix of paddock and regrowth vegetation within the MVOA allows for the achievement of immediate and long-term conservation outcomes that occur as soon as the MVOA is legally secured prior to the commencement of clearing at the project site. Legally securing the MVOA for the duration of the impact will ensure existing and future owners are prohibited from conflicting land uses, such as vegetation clearing for agriculture and cattle grazing which limits natural regeneration. • Following the approval and implementation of this OMP, management actions outlined within **Section 8** will commence and continue for the duration of the approval. In addition, adaptive management processes will ensure management actions respond to technology improvements, natural events and potential risks identified in the risk assessment (**Section 9**).

EOP Requirements Suitable offsets must:	Delivery
	Transparent: • The baseline surveys established the survey methodology to be used for the monitoring and reporting required for the lifetime of the approval (**Section 6**). A clear monitoring and reporting framework is established within this OMP (**Section 8**). Monitoring and reporting of the MVOA will be summarised within the MVOA Annual Report provided by the Offset Provider which is then included in the Annual Compliance Reports (ACRs) for the project. Scientifically robust: • The proposed MVOA was assessed by 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 MVOA 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: • The offset is considered reasonable as the MVOA is greater than the significant residual impact on both Koala and GHFF habitat and provide a **116.08%** offset for the Koala and a **116.56%** offset for the GHFF based on the quantum impact (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.
Have transparent governance arrangements including being able to be readily measures, monitored, audited and enforced	This OMP provides a detailed monitoring and reporting framework, performance criteria, and corrective actions (**Sections 7, 8 and 9**). 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 *Environment Protection and Biodiversity Conservation Regulations 2000* (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. ACRs must be published on the approval holder's website in accordance with an EPBC Act approval and may 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 may be published on the Department's website or through the general media.



5.5.1 Compliance with Plans, Strategies and Conservation Advice

5.5.1.1 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.

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 for 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 development 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 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 MVOA will create a net gain of Koala habitat, with improved habitat quality, connectivity, and longevity over the impact site. 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 grazing practices and agricultural activity which currently encompasses the MVOP and surrounding landscape.

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 development proposes to impact 7.38 ha of habitat identified as critical for the survival of the Koala, the habitat on-site contains evidence of historical logging practices and is surrounded by urban values and infrastructure limiting potential use by Koala. Within the MVOA a total of 25 ha will be legally secured and rehabilitated, providing uplift in the Koala habitat values. The wider property which MVOA is located within is also proposed for future offsets. This wider property is partially within regional and state biodiversity corridors with vegetation in the MVOA connecting through to these corridors. The corridors have been identified by the State government to provide large tracts of vegetation for terrestrial and aquatic connectivity, diversity and refugia for a range of species. Rehabilitation and protection of the offset site therefore mirror the strategic intent of the biodiversity corridor set out by the Queensland government.

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 proposed impact will involve the removal of habitat critical to the survival of the Koala habitat within a rapidly urbanising area, all significant residual impacts are to be compensated through the provision of land-based offsets. Proposed offsets will be located in Koala occupied areas of connected and resilient habitat where urban impacts are limited.

5.5.1.2 South East Queensland Koala Conservation Strategy

The South East Queensland Koala Conservation Strategy 2020-2025 (the Strategy) 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.

The proposed action has sought to reduce impacts to the Koala through the avoid, mitigate and offset hierarchy. The proposed residential development will be entirely located within the RVPDA and will require the unavoidable removal of all Koala habitat on site. Further, the retention of the Koala dispersal habitat on site would quickly become redundant given the expected development of surrounding properties with no vegetation retention. All vegetation clearing under the proposal will be government by State requirements for fauna management and the significant residual impacts will be compensated through land-based offsets, in an area surrounded by other future offsets and a nearby regional biodiversity corridor that will ensure connectivity and longevity of the rehabilitated habitat is protected.

The proposed offset has considered the Action Areas of the Strategy with the issues addressed in the Strategy discussed in the following sections.

Action Area 1: Habitat Protection

Action Area 1 of the Strategy is the protection of Koala Habitat Areas (KHA).The project requires the removal of 7.38 ha of habitat critical to the survival of Koala as defined under the EPBC Act. The development site occurs within the RVPDA and is not mapped as a KHA at the State level therefore is not protected by the conservation strategy. The purpose of this Action Area is the persistence of Koala in SEQ. As the impact area occurs within a highly modified landscape with limited availability for safe movement and further urbanisation proposed, the vegetation within the impact area is not considered viable to support Koala. The protection and creation of 25 ha of Koala habitat within MVOA will provide connection and protected habitat within an area known to support Koala.

All vegetation clearing within the impact site 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. This will limit potential impacts to Koala as a result of the vegetation clearing.

Action Area 2: Habitat Restoration for Koalas

Action Area 2 addresses the necessity for restoration of Koala habitat in order to allow recovery of the species. The project will impact 7.38 ha of Koala habitat, however as noted previously the impact area is located in the north-west of the RVPDA and as a result, is surrounded by similar development applications and approvals. Therefore the 7.38 ha of habitat is not viable to retain and restore due to the current lack of connectivity which is only going to increase into the future. Proposed offsets for the removal of the 7.38 ha of Koala habitat will occur within areas of connected and resilient habitat where records of Koala are present and impacts from urban activities are limited. Significant uplift in habitat quality is possible within the proposed MVOA offset given the large areas of non-remnant open paddock that can undergo large scale planting of Koala trees and modified regrowth vegetation that connect to large areas of intact vegetation that can be uplifted through weed management and natural regeneration. This aligns with the Strategy intent where the purpose of restoration is the net gain in Koala habitat and increase in connectivity between areas of habitat.

Action Area 3: Threat management

Under Action Area 3, the Strategy lists habitat loss, including from inappropriate fire regimes and invasive weeds, in addition to dog attacks, car strikes and disease as key threats affecting Koala. As such, mitigation and management of these threats are essential to the long-term viability of Koala populations in SEQ. The proposed impact site occurs within the RVPDA where threats such as dog attack, car strike and disease, due to the risk of limited gene variation if Koala were to utilise the 7.38 ha of isolated vegetation on-site, are already significant. A review of Koala hospital data (Department of Environment and Science 2021) indicates that there are numerous sick, dead and injured Koalas within a 10 km radius of the impact area. This demonstrates the risk vehicles, dogs, and disease pose to Koala in the Ripley Valley Region. The threat of vehicle strike for the Koala with regards the impact area even more significant given the small overall area of the site and likelihood for Koala to attempt to cross highly trafficked roads to enter surrounding bushland.

Proposed offsets within the MVOA occur within rural areas adjacent to intact bushland that are mapped within regional and state biodiversity corridors. The location of this offset area limits risk of vehicle strike to Koala however threats in the form of feral animal predation, invasive weeds and bushfire currently persist (**Section 5.2.6**). This OMP outlines the management and mitigation measures proposed across the MVOA to prevent, control and reduce key threats to Koala.

Action Area 4: Improved mapping, monitoring, research and reporting

Action Area 4 intends stronger research and monitoring of Koala distribution and threat of impacts. Although data will be collated on the presence of Koala within the MVOA and surrounding offset property and reduction of or prevention of threats, this will be utilised to inform the progress of the offset area and is not a research program.

Action Area 5: Community Engagement

Action Area 5 proposes local communities to have a role in Koala protection. Awareness signage and traffic calming devices will be employed at the impact site 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. Further, the proponent will continue to be involved in perpetuity the proposed development, providing ongoing management of the action.

Action Area 6: Partnerships and strategic coordination

Action Area 6 proposes similar outcomes to Action Area 5 where different stakeholder groups should be engaged to improve Koala conservation. This is not considered applicable to the impact area as the intention of this strategy addresses improved and collaborative governance rather than residential development projects.

5.5.1.3 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 and support the recovery of the GHFF 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 approved National Recovery Plan lists the overall objectives for the GHFF to improve the national population trend by reducing in impact of threats through habitat identification, protection, restoration and monitoring as well as assisting communities and GHFF to coexist through education, stakeholder engagement, research, policy and continued support to fruit growers.

It should be noted that, while the national GHFF population was thought to be in decline, counts carried out by CSIRO since 2012 as part of the National Flying-fox Monitoring Program (NFFMP) have shown GHFF numbers have been stable over that period. A recent paper published by Vanderduys *et. al.* (2024) noted "Despite the general perception that the species is in decline, our raw data and the modelled population trend suggest the Grey-headed Flying-fox population has remained stable during the NFFMP period, with the range also stable. These results indicate that the species' extreme mobility and broad diet bestow it with a high level of resilience to various disturbance events". Counts suggest a stable or slightly increasing national GHFF population of between 622,000 and 692,000 individuals.

In addition to the positive count numbers, the study suggest surveys may have missed populations between central and northern Queensland as count data has been provided for sites near Rockhampton and Ingham but nothing in between. Further, given the absence in data in certain areas, populations may also exist in remote or difficult to access areas, such as mangrove forests, that have not been included in the national survey.

The proposed impact will result in the removal of 7.38 ha of foraging habitat for the GHFF. Offsets as a result of the development will deliver 25 ha of MNES within the Mountain View Offset Area (MVOA). This offset area will be protected in perpetuity with rehabilitation including natural regeneration and planting of GHFF foraging species will allow for a net conservation gain for the species.

The plan addresses the key threats facing the GHFF 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 within the impact area, the site is located within 20 km of known GHFF roosts and foraging habitat occurs within the project site. Habitat critical to the survival of the species is considered important winter and spring flowering vegetation communities, and natives that are known to be productive from August to May. 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 *E. siderophloia, E. tereticornis,* and *C. citriodora* were recorded within the impact area. As such, the proposed action will result in the unavoidable loss of 7.38 ha of potential foraging vegetation considered critical habitat for the GHFF.

An offset for the loss of potential GHFF foraging habitat will be provided and will increase the available forging habitat for the GHFF.

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

There are no roosts within the project area. Preferred roosting habitat for the GHFF is poorly understood, and so it is difficult to preserve potential roosting habitat for the species. The impact area proposes the removal of 7.38 ha of potential foraging habitat for the species which will be offset in the MVOA, resulting in a nil net loss of habitat and ultimately a gain in potential foraging habitat for the species.

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 and at the MVOA 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

Not applicable. There are no observed roosts on-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

Not applicable.

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.

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

Not applicable. The project is not for commercial horticulture.

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

Not applicable. The project does not propose research projects.

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

Electrocution on powerlines and entanglement on barbed wire are a risk to GHFF. Although barbed wire occurs within the impact site, this species is considered a temporary and intermittent visitor to the site due to lack of detection during fauna surveys. These impacts will be managed through the implementation of mitigation measures and procedures outlined within future management documents for the specific impact area including the VCFMP. As such, the proposed action is not considered likely to impact the recovery of this species.

In regard to the proposed offset area, the risk of barbed wire entanglement will be managed by retrofitting fences within the MVOA. The broader property is also proposed to be included as offsets for separate EPBC application projects. Therefore, the wider MVOP will also be managed for threat reduction on GHFF.

6. Baseline Surveys

6.1. Offset Area Baseline Surveys - Methodology

Baseline field surveys to determine habitat quality for Koala and Grey-headed Flying-fox, non-native vertebrate pest presence and invasive flora densities were completed on 15th and 18th September and 3rd October 2025.

Table 29: MVOA baseline survey methods summary

Date	Temperature (°C)	Rainfall (mm)	Methods implemented
15 September 2025	8.0 min – 26.4 max	0.2	2x Camera trap deployment MHQTs 2 - 3 and SAT 1
18 September 2025	13.9 min - 31.6 max	0	MHQT 5 and SAT 3
3 October 2025	10.2 min - 29.6 max	0	2x Camera trap collection WONS mapping and weed cover transects

NB: Data sourced from Bureau of Meteorology (BoM): Temperature from Station 040983 Beaudesert Drumley Street, rainfall from Station 040754 Rathdowney TM.

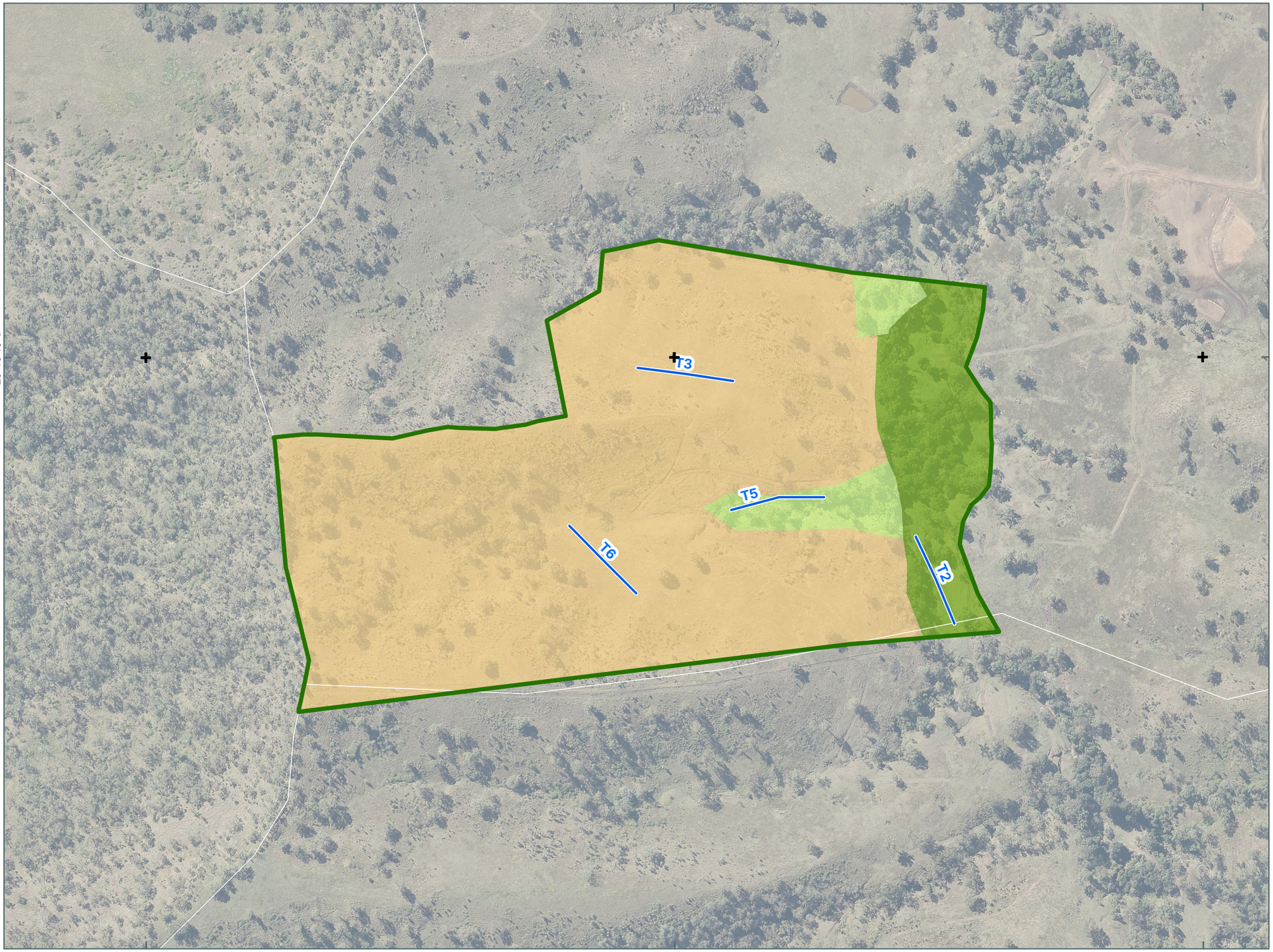
6.1.1 Habitat Quality – Koala and Grey-headed Flying-fox

The MHQA and FHA assessment methodology for Koala and GHFF respectively utilised for the impact area (described in **Section 3.3.1** and **3.3.2**) were also applied to the MVOA. Three (3) AUs were identified in the MVOA. These are summarised in **Table 30** and shown in **Plan 7**. Site Condition was measured through the completion of MHQA transects. Assessment at multiple locations per AU is necessary where possible to measure vegetation condition at representative locations across the spatial extent of each assessment unit (refer **Section 6.2.1** for details). Notably, only one (1) MHQA transect was completed in AU2 (regrowth RE12.8.17) as these polygons were not of sufficient size for to complete second transect in accordance with the methodology defined in the *guide to determining terrestrial habitat quality.*

Table 30: MVOA - Summary of Assessment Units and MHQA transects

AU	Vegetation community	Area (ha)	Transects
1	Regrowth RE 12.3.3	3.2	2
2	Regrowth RE 12.8.17	1.2	5
3	Cleared Paddocks	20.6	3

07. 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.

Layer Sources

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Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

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Updated data available at

LEGEND

- Qld DCDB
- Offset area
- MHQA Transects [4]

Assessment Units

- Assessment Unit 1: Regrowth RE 12.3.3 [3.2 ha]
- Assessment Unit 2: Regrowth RE 12.8.17 [1.2 ha]
- Assessment Unit 3: Cleared Paddocks [20.6 ha]



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0 20 40 60 80 100 m

Transverse Mercator
GDA 2020 | Zone 56

1:4,000
@ A3

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Address / RPD: Binnies Road, Ripley

17/02/2026

11826 E 10 Offset Area AUs B

6.1.2 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 and is described in section 3.3.1 as part of the description of the species stocking rate assessment. A total of two (2) SAT surveys were completed across the MVOA in conjunction with MHQA transects 2 and 5 where adequate tree densities were available to target presence of Koala (**Plan 8**).

Tree density was assessed in a 100 m by 100 m (1 ha) area. The MHQA transect line forming the centre line of the assessment area with a 50 m search area either side. A SAT survey was only conducted if 30 or more non-juvenile trees were present in the 1 ha search area. Tree density was also assessed through the counting of Grey-headed Flying-fox (GHFF) foraging trees. The GHFF assessment includes counting all foraging trees within a 0.2 ha area. If less than six (6) trees were counted in the 0.2 ha area than it provided additional evidence that there were likely less than 30 non-juvenile trees within the 1 ha search area and a SAT survey was not required.

6.1.3 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 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 an infrared trigger. The use of camera trapping is an effective method in capturing, assessing and monitoring pest management. At present, DCCEEW does not have a published guideline for detecting feral animals. The *Survey Guidelines for Australia's Threatened Mammals (2011)* was reviewed as a published methodology for detecting mammals. However, this guideline focuses on highly cryptic threatened species with small home ranges. In contrast, feral animals are far less cryptic and significantly more mobile with larger home ranges than most native species.

As the purpose of this assessment is to survey feral animal abundance, the *Survey Guidelines for Australia's Threatened Mammals* is considered excessive and impractical for an area of this size. **Table 31** below outlines key feral animal presence within the region and their associated home ranges. Several papers outline required density of cameras to monitor abundance of specific feral mammals, typically utilising a grid-based system applied over the survey area. The grid-based system is a standard method of unbiased assessment, with the purpose being that each camera is equidistant from the other. The literature recommends grids from 500 m x 500 m, and frequently up to 1 km x 1 km to ensure suitable coverage.

The number of camera traps required for a specific survey area is dependent on the individual characteristics of the survey site (size and variety of vegetation communities) as well as the behaviours of the specific species being targeted (mobility/home range). Threatened species guidelines recommends ten (10) remote cameras per ha, though as mentioned this is a result of its focus on cryptic, less mobile threatened species. Given the large home range of the target species, Wild Dogs (**Table 31**) and size of the offset area, two (2) camera traps were installed across the 25 ha MVOA for a period of 18 nights from 15 September to 3 October 2025 (**Plan 8**) approximately 300 m apart. Cameras were located within vegetated areas in the east of the site associated with Dip Gully. These locations provided the most suitable areas for detecting feral animals, with the balance of the site dominated by pasture grasses which would likely result in false triggering and poor results. All future pest detection surveys should be conducted at a similar time each year to allow for valid comparisons in species abundance/activity trends. **Table 32** provides a description of camera deployment locations.

Camera trap set up and deployment was conducted as per the Queensland Government's *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (June 2022). The guideline advises this survey technique should be employed to identify 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 a bait station placed 1.5 – 2 m from the mounted camera. Bait stations contained chicken necks to target Wild Dogs and other known potential predators to MNES. The bait station utilised does not allow the target animal to consume the bait. Rainfall was minimal during the survey period, and so it was not necessary to replenish the bait (**Table 29**).

Within the pre-determined camera location, cameras were directed towards animal tracks to increase the chances of detection and identification. 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. Where not possible to place the cameras exactly within the grid system, cameras were placed in the most suitable location and 'site type' (e.g. track, bush, open area).

In addition to the two (2) cameras deployed within the MVOA as part of this project, the broader MVOP has been subject to additional surveys under separate projects and offset proposals which included camera deployment. The results of these additional cameras in the MVOP provides further assessment of potential threats in the local area.

6.1.4 Relative Abundance Index

The results of the motion-triggered camera detection survey were utilised to provide relative abundance of non-native vertebrate pest species over the MVOA, 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.

Table 31: Camera grid size justification

Target Animal	Approx. Home Range	References	Spacing Recommendations
Dog	>250 ha	Department of Primary Industries, NSW Government (2018), Guidelines for camera trapping Wild Dogs, foxes and feral cats	1 km
		Northern Territory Government (2015), A guide for the use of remote cameras for wildlife survey in northern territory	500 m
		Contardo, J. E. (2017). Occupancy of free-ranging dogs in relation to infrastructure and habitat on Navarino Island, Cape Horn Reserve, Chile	700 m
		Department of Industry, (2017). NSW Wild Dog Management Strategy 2022-2027	700 m
		McNeill et al (2016), Dingoes at the Doorstep: Home Range Sizes and Activity Patterns of Dingoes and Other Wild Dogs around Urban Areas of North Eastern Australia	700 m

Table 32: Fauna camera trap summary (15 September – 3 October 2025)

ID	Latitude	Longitude	Photo	Location description
1	28°13'28.59"S	152°55'11.91"E		Camera 1 was deployed within the north-eastern portion of the MVOA adjacent to Dip Gully within mapped endangered high-value regrowth vegetation.

ID	Latitude	Longitude	Photo	Location description
2	28°13'38.21"S	152°55'10.56"E		Camera 2 was deployed in the central portion of the MVOA, in the ecotone between mapped endangered and of concern regrowth vegetation along the same creek line as Camera 1, Dip Gully.
3	28°13'44.50"S	152°55'07.48"E		Camera 3 was deployed in the central southern portion of the MVOA, within of concern regrowth vegetation along a small gully tributary of Dip Gully.

08. OFFSET AREA BASELINE FIELD SURVEY EFFORT



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Updated data available at

LEGEND

- Qld DCDB
- Offset area

Baseline Field Survey Effort

- Observational surveys
- MHQA Transects [4]
- SAT Survey Locations [2]
- Camera Trap Locations [2]



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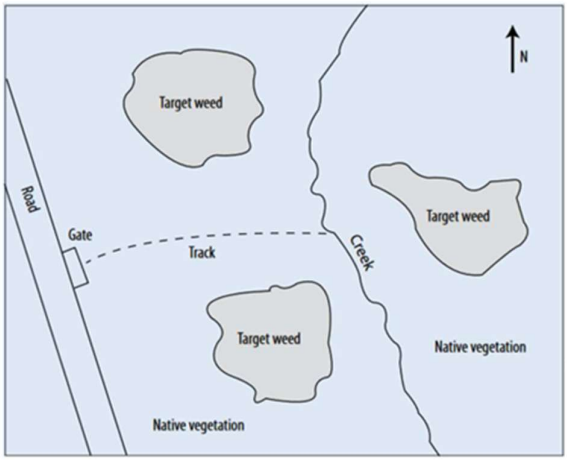
6.1.5 Weeds of National Significance mapping

The primary weed species targeted by weed surveys within the MVOA was *Lantana camara* (Lantana) due to its known threats to Koala and GHFF habitat and classification as a WONS. The secondary target species Senecio madagascariensis (Fireweed), due to its known competition to native vegetation and identification as a WONS. The percentage cover of WONS was determined using a two-step method detailed in the *Guidelines for Monitoring Weed Control and recovery of native vegetation* (Auld 2009).

In order to gain a more complete view of weed coverage across the MVOA and therefore provide a more succinct idea of weed management activities mapping of weeds on-ground was conducted utilising the following methodology.

Step 1: Delineate weed patches

Using an antenna-based GPS system, the spatial extent or patches of WONS and other weeds within the MVOA were mapped on-ground as polygons to produce a 'mud map' of the site (**Extract 2**). Each polygon was given an initial visual estimate of WONS percent coverage within the following categories: Low (<25%), Moderate (25-50%), and High (>50%). 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. Where some species are difficult to delineate at this scale, (Fireweed) coverage is calculated utilising transects only.



Extract 2: 'Mud map' from Auld (2009) – Figure 1

Step 2: Line-transect method

To quantify the percentage cover the mapped areas 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 and is instead accurately measured against a tape, typically standardised at 100 m in length. With this technique, the percentage cover of all weed species (WONS and non-WONS) along the line transect is recorded. Because shrubs may overlap plants growing closer to the ground, the total percentage cover of vegetation over an area

may be greater than 100%. The data is recorded in metres but can be interpreted as a percentage (refer **Extract 3**).

Three (3) 100 m transects were established across the MVOA, within the moderate density *Lantana camara* adjoining and within the gully line vegetation, and in the cleared open paddock with scattered *Lantana camara* that comprises the balance of the site. Auld (2009) does not prescribe a minimum number of line-transects, a feature of other transect methods such as the BioCondition Assessment Manual. The three weed transects within different weed densities is considered to provide a good overview of the MVOA due to the small size of the MVOA and similar characteristics across the area. As such, the location of transects are considered adequate to represent the general condition of the MVOA.

Future surveys to estimate the weed cover will emulate the methodologies completed for baseline surveys as per Auld (2009). In addition, MHQA transects also involve a component of weed cover estimation.

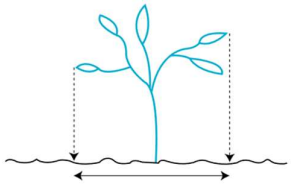


Figure 5. Ground cover of a plant indicated by the horizontal arrowed line.

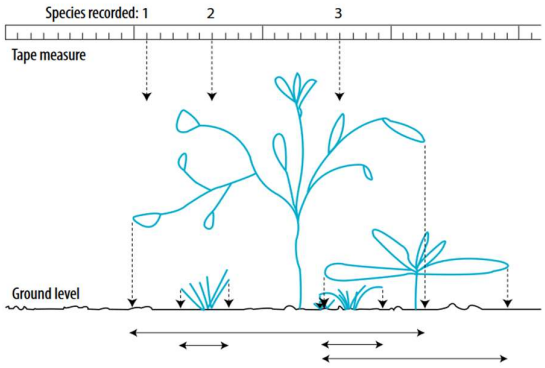


Figure 6. Overlapping vegetation means that total ground cover is often more than 100%. Three different sampling points indicated on the tape measure, used as a line-transect, will record either one, two or three plants.

Extract 3: Method for measuring weed coverage from Auld 2009

6.2. Offset Area Baseline Assessment Results

6.2.1 Assessment Unit Description

The MVOA is mapped as contain a mixture of Category C (high-value regrowth) and Category X (non-remnant) vegetation under the Queensland *Vegetation Management Act 1999* (VMA). The Category C regrowth vegetation is mapped with endangered composite regional ecosystem in the far east of the MVOA and a of concern composite regional ecosystem through the centre of the site. Both areas of regrowth vegetation are mapped as following Dip Gully through the east of the site and two of its tributaries.

On-ground surveys identified the entire area to have been highly modified for rural uses including broad-level slashing, prescribed burn offs, cropping for fodder, and cattle grazing. As a result of the significant modification, the desktop mapped extent of VMA regulated vegetation required ground-truthing to establish assessment units. As is mapped, the regrowth vegetation was observed to be associated with the steep gully lines where significant historical clearing is less likely to have occurred. Notably, denser patches of *Lantana camara* (Lantana) were observed in these locations, largely within the steepest areas where slashing and maintenance cannot readily occur. Regardless of the mapped regrowth status, these vegetated areas are intensively grazed, limiting the understory vegetation to grasses and invasive forb species. Further, portions of the mapping lack canopy vegetation and fence lines and vehicle tracks occur throughout these vegetated areas including a regularly used vehicle track through Dip Creek. Adversely, open paddock areas lack regrowth vegetation and are dominated by pasture grasses with sparsely located large trees.

In addition, field surveys noted that the Land Zone 3 mapping was not entirely accurate with the definition between Land Zone 3 and Land Zone 8 relatively undefined in portions. As such, on-ground surveys recorded areas of Land Zone 3 encroaching further west into mapped Land Zone 8 as delineated by steep gully banks. This is likely due to significant modification from cattle and lack of vegetation resulting in shifting soils and erosion which has altered the location of Land Zone 3. Subsequently, the area of AU1 (HVR containing Endangered composite RE 12.3.3/12.3.2/12.3.7) appears to encompass areas of Of Concern composite RE 12.8.17/12.8.16/12.8.14, however was ground truthed to all reflect Land Zone 3 ecosystems.

The MVOA was delineated into three (3) separate Assessment Units based on the ground-truthed non-remnant, and regrowth vegetation communities under the MHQA methodology. The location of the three (3) delineated Assessment Units and their associated MHQA transects are shown on **Plan 10**. Detailed descriptions of each are provided below.

Assessment Unit 1 – Regrowth Endangered RE 12.3.3

AU1 comprises regrowth woodland vegetation through the eastern portion of the MVOA and along the main gully through the site, Dip Creek and encompasses 3.2 ha of the 25-ha offset area. MHQA Transect 2 was completed within this AU.

VMA mapping indicates the area to contain Endangered composite RE 12.3.3/12.3.2/12.3.7. On-ground investigations observed the vegetation present to most align with RE 12.3.3, therefore Habitat Quality that were conducted within this area were assessed against BioCondition benchmarks for RE 12.3.3. In addition, as mentioned above, portions of this AU occur within areas mapped as containing Of Concern composite RE 12.8.17/12.8.16/12.8.14 however on-ground surveys found that the areas were more reflective of Land Zone 3.

Native canopy vegetation occurs along the banks and through the waterway with open paddock space dominated by grass where clearing and grazing has readily occurred as shown in **Photo set 2**. Species are generally reflective of the mapped RE 12.3.3, with the dominant species being *Eucalyptus crebra* (Narrow-leaved Ironbark) with *E. tereticornis* (Forest Red Gum) and *Corymbia intermedia* (Pink Bloodwood) and *Angophora floribunda* (Rough-barked Apple) through along waterway slopes. Natural regeneration of canopy species and shrubs are almost absent due to cattle grazing. The ground layer is dominated by restricted invasive species *Sporobolus natalensis* (Giant Rat's Tail Grass) and *Senecio madagascariensis* (Fireweed) with native grasses throughout, *Digitaria didactyla* (Queensland Couch), *Heteropogon contortus* (Black Speargrass), and *Imperata cylindrica* (Blady Grass). Weeds are generally low throughout as a result of cattle grazing however moderate patches of *Lantana camara* (Lantana) are present at the steepest portions of the creek.

Surveys observed pockets of rainforest species within the waterway, which are not typical of RE 12.3.3 but are not unusual within riparian environments. These patches are only minor and are not reflective of any pre-clear RE's and are therefore considered a natural variation of the community rather than different ecosystems.

MNES values in this AU are tied to the mature and regrowing native trees which provide potential food and shelter resources for Koala and GHFF. Weed management and assisted natural regeneration techniques would improve the speed and success of the regeneration of these values. Infill planting will be required where natural regeneration is insufficient, and cattle exclusion will assist in revegetation works.



Photo set 2: AU1 vegetation, mapped regrowth vegetation along the banks of Dip Creek through the east of the site.

Assessment Unit 2 – Regrowth Of Concern 12.8.17

AU2 comprises three small polygons of regrowth vegetation on the upper banks of the main waterway in the central portion of the MVOA, encompassing 1.2 ha of the 25-ha offset area. VMA mapping indicates the area to contain Of Concern composite RE 12.8.17/12.8.16/12.8.14. On-ground investigations observed the vegetation present to most align with RE 12.8.17, therefore Habitat Quality that were conducted within this area were assessed against BioCondition benchmarks for RE 12.8.17. MHQA Transect 5 was completed within the largest polygon of this AU. The other two polygons which were confirmed on-ground to reflect this AU were two small to fit a 100 m x 50 m transect however quaternary surveys were conducted to assess the value of the vegetation.

Native canopy composition within this AU is not dissimilar to AU1, where patches largely remain along gully lines and large gaps in the canopy are present (**Photo set 3**). Vegetation within this AU is reflective of the mapped RE 12.8.17, with the canopy co-dominated by *Eucalyptus crebra* (Narrow-leaved Ironbark) and *E. tereticornis* (Forest Red Gum) with *Angophora subvelutina* (Broad-leaved Apple), *Corymbia tessellaris* (Moreton Bay Ash) and *Melaleuca bracteata* (Black Tea Tree). Regenerating canopy species are largely absent as a result of heavy cattle grazing. Similarly, extensive slashing and grazing has resulted an absent or limited shrub layer and the ground being dominated by invasive forb and grass species; *Senecio madagascariensis* (Fireweed), *Digitaria didactyla* (Queensland Couch), *Heteropogon contortus* (Black Speargrass), and *Imperata cylindrica* (Blady Grass).

Removal of grazing activity and extensive weed management will be required to allow for assisted natural regeneration that will improve habitat values for Koala and GHFF. In areas significantly lacking canopy vegetation rehabilitation (planting, seeding, etc) will be required.



Photo set 3: AU2 vegetation, regrowth woodland vegetation through the gullies and upper banks of Dip Creek, reflecting Land Zone 8

Assessment Unit 3 – Cleared Paddocks

AU3 comprises the balance of the MVOA and consists of cleared grazing paddock with sparse trees and significant modification, as shown in **Photo set 4**. This AU dominates the MVOA, encompassing 20.6 ha of the 25-ha offset area. The entirety of AU3 incorporates areas of non-remnant vegetation under the VMA. Pre-clear RE mapping across the Category X (non-remnant) vegetation is also predominantly RE 12.8.17/12.8.16/12.8.14, with small areas of RE 12.3.3/12.3.2/12.3.7 adjacent the main waterway. As indicator species of these RE are absent, Habitat Quality Transects assessed against the historically dominate RE, 12.8.17. MHQA Transect 3 was completed within this AU.

Tree species are extremely sparse in this area, with only *Corymbia tessellaris* (Moreton Bay Ash) recorded in the Canopy or Sub-canopy layers. This species is not an indicator species of the pre-clear REs. Due to significant modification, the shrub layer is almost entirely absent with exception to very sparse *C. tessellaris* regrowth. The ground layer is largely dominated by invasive forbs and grasses typical of pastural land including *Senecio madagascariensis* (Fireweed), *Gomphocarpus physocarpus* (Balloon Cotton Bush), *Melinis repens* (Red Natal Grass), and *Sporobolus natalensis* (Giant Rat Tail's Grass). Portions are dominated by native pastural grass, *Heteropogon contortus* (Black Speargrass) that have been heavily grazed by cattle.

MNES values in this AU are limited to scattered native trees. Weed management, broad revegetation, and assisted natural regeneration techniques will be necessary to restore most of the proposed offset site to functional, connected, quality Koala and GHFF habitat.



Photo set 4: AU3 vegetation, open grazing paddock with very sparse trees

6.2.2 Non-native Vertebrate Pest Abundance Surveys

A combined total of 36 surveys nights (2 cameras for 18 nights) did not detect any non-native vertebrate pest animals, though other native fauna species were captured during this survey. Three native mammals; *Phascogale tapoatafa* (Brush-tailed Phascogale)**,** *Trichosurus vulpecula* (Common Brushtail Possum), and *Isoodon macrourus* (Northern Bown Bandicoot), one monotreme, *Tachyglossus aculeatus* (Short-beaked Echidna), and two invasive mammals; *Rattus rattus* (Black Rat) and *Mus musculus* (House Mouse), were captured on the fauna cameras within the MVOA (refer **Photo set 5**). No Wild Dogs were captured utilising the site. As no

observations were made RAI was not calculated, though these methods will continue to monitor for changes in feral animal abundance.

Despite the lack of evidence within MVOA during field survey, it is considered likely that non-native vertebrate pests are present. Public databases contain records of non-native predators in the surrounding landscape including Wild Dogs, which are listed as pests by SRRC, and local landowner knowledge confirms the presence of dogs historically. Further, although not recorded within the MVOA during field surveys, motion-sensor fauna camera traps deployed in the wider MVOP recorded multiple Wild Dogs over the broader property (**Photo set 6**). In addition, research by Pest Animal Management QLD (2020) found that the Scenic Rim region contains an abundance of Wild Dogs, with evidence indicating that calf predation has increased significantly in the last decade. Given the property and surrounding properties are utilised for cattle, there is likely a high presence of Wild Dog attracted to calving cattle.

As such, pest control is still considered an important management action to maintain low numbers of non-native vertebrate pest animals, in particular, maintain zero occurrence of Wild Dog within the MVOA.



Photo set 5: Camera trap images of native *Phascogale tapoatafa* (Brush-tailed Phascogale) (*Left*) and *Tachyglossus aculeatus* (Short-beaked Echidna) (*Right*) within the MVOA.



Photo set 6: Wild Dogs recorded in the wider offset property (MVOP)

6.2.3 Weeds of National Significance Mapping

Weed presence within the MVOA varies from exotic grasses and forbs dominating open paddocks to dense patches of *Lantana camara* (Lantana) within gully lines. The presence of Lantana is particularly notable as it is a known barrier to Koala access of otherwise suitable habitat trees. The density of infestations within the MVOA ranges from low to moderate, with scattered patches and specimens through cleared paddock areas. However, the highest concentrations occur within the gullies where maintenance and cattle grazing have not been as significant (refer **Photo set 7**). Given the dominance of cleared paddocks within the MVOA, low density WONS coverage (<25% Lantana) was recorded across the majority of the MVOA (24.6 ha) with 0.4 ha of moderately dense lantana (25-50%) (refer **Plan 9**). Fireweed, also considered a WONS, was captured in the weed cover transects (refer **Table 33**) and recorded as <25% across all transects (refer **Photo set 8**). Refer **Appendix C** for raw weed cover data.

Table 33: Weed coverage transects results summary

Density Category	Weed cover Transect	WONS coverage (%)	Average Coverage (%)	Area (ha)	Relative WONS coverage (ha)
Low (Lantana)	1	0	0.5	24.6	0.12
	3	1			
Moderate (Lantana)	2	49	49	0.4	0.20
Fireweed	1	20	7.66	25	1.9
	2	0			
	3	3			
Total				**25**	**2.22**

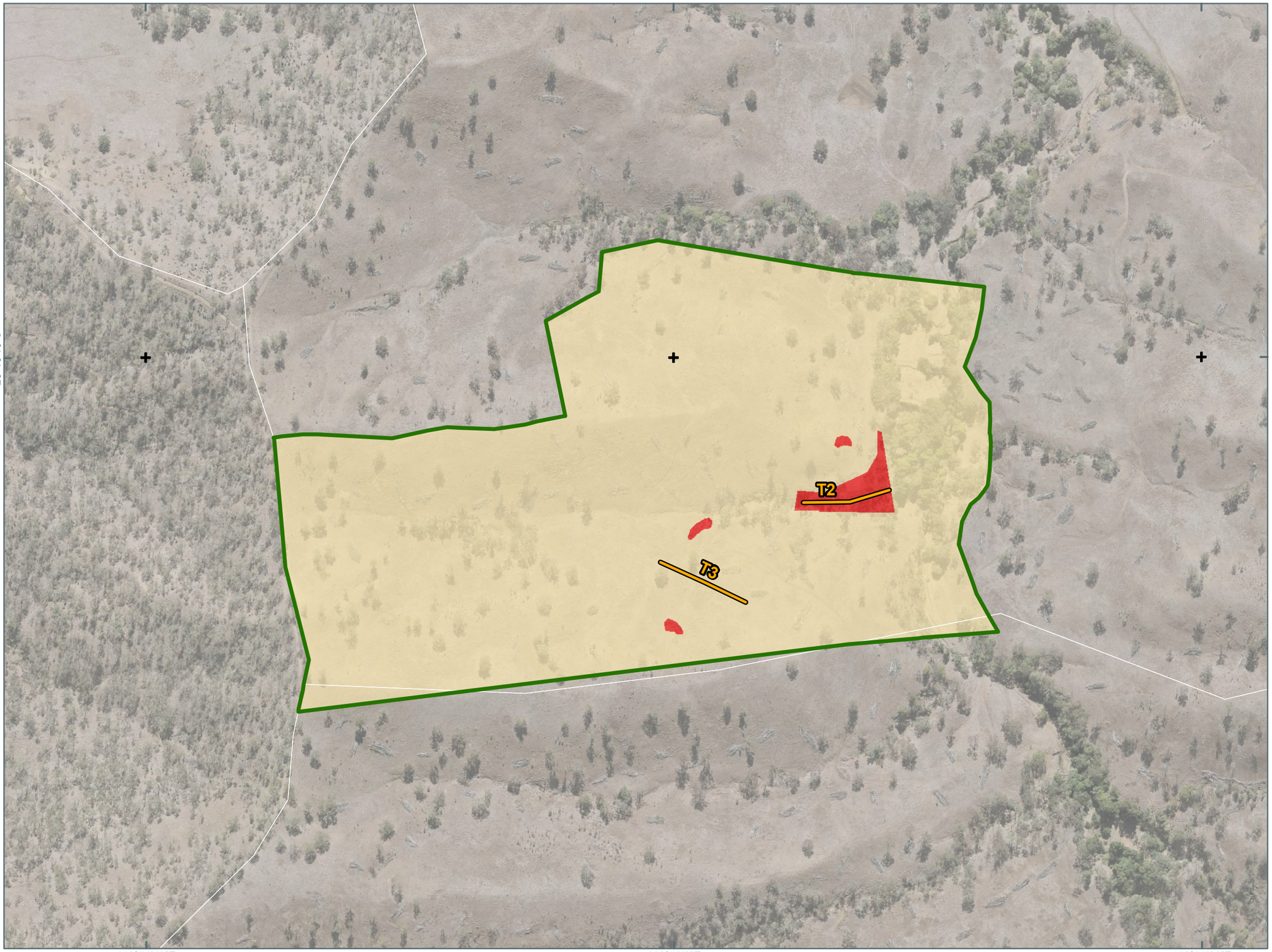


Photo set 7: **'**Moderate' density Lantana through gully (25-50% - Transect 2)



Photo set 8: Scattered patched of Lantana through paddock areas (left). Fireweed and other ground cover weeds through paddock areas (right)

09. OFFSET AREA BASELINE WEED MAPPING



Notes:
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LEGEND

- Qld DCDB
- Offset area
- Weed Transects [2]

Baseline Weed Mapping

- Low density lantana (<25%) [24.6 ha]
- Moderate lantana (25-50%) [0.4 ha]



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6.2.4 Koala SAT survey results

Two (2) SAT assessments were completed across the MVOA within AU1 and AU2. SAT surveys could not be completed within AU3 as there were not enough trees present. A minimum of 30 non-juvenile trees per ha are required to complete a SAT assessment. No Scats were recorded from surveys completed within the MVOA. As such the MVOA has been deemed with a no usage by Koala, largely due to the dominance of open paddocks with limited connectivity (**Table 34**).

Through the implementation of management actions associated with this OMP, Koala habitat and connectivity within the MVOA will improve, allowing for increased usage by the species.

Table 34: SAT surveys result from Mount View Offset Area

SAT Site Number	SAT Score	Evidence of Koala Use (%)	Koala Use (High/Medium/Low)
AU1			
SAT 1	0/30	0%	No Use
AU2			
SAT 3	0/30	0%	No Use
AU3			

N/A – No SAT undertaken due to lack of Koala habitat trees (i.e <30 trees per 1 ha)

6.2.5 Koala MHQA Transects

Site Condition (30%)

Scores utilised the same methodologies described in **Section 2** for the impact area. The Site Condition scoring for the MVOA is summarised in **Table 35**. Refer to **Appendix B** for detailed baseline Koala MHQA scoring and **Appendix C** for raw data.

Table 35: MVOA – Site Condition scores for assessment units

Attribute	AU1	AU2	AU3
Regional Ecosystem	12.3.3	12.8.17	12.8.17
Remnant/Non-remnant/Regrowth	Regrowth	Regrowth	Non-remnant
Recruitment of woody perennial species in EDL	3	3	5
Native plant species richness - trees	5	2.5	0
Native plant species richness - shrubs	0	2.5	2.5

Attribute	AU1	AU2	AU3
Native plant species richness - grasses	2.5	2.5	0
Native plant species richness - forbs	0	2.5	0
Average tree canopy height*	5	5	1.5
Average tree canopy cover*	5	3.5	0
Shrub canopy cover	0	0	0
Native grass cover	5	5	5
Organic litter	3	3	0
Large trees	5	5	0
Coarse woody debris	2	0	0
Non-native plant cover	5	5	3
Quality and availability of food and foraging habitat	5	5	1
Quality and availability of shelter	5	5	1
Total (Out of 100)	48.5	49.5	19
Score out of 3	1.52	1.49	0.57

Quality and availability of food and foraging and shelter habitat

The site condition values for AU1 and AU2 scored **5 out of 10** for quality and availability of food and foraging and shelter habitat and AU3 scored **1 out of 10** for these attributes utilising the methodology described in **Section 3.3**. Results for each of the AUs are provided below.

Koala food and foraging habitat scoring

Koala Food Tree Abundance

Assessment Unit	RE	Benchmark (trees/ha)	Site Count (trees/ha)	Benchmark Percentile	Score
Offset AU1	12.3.3	115	20	17%	2/8
Offset AU2	12.8.17	160	45	28%	4/8
Offset AU3	12.8.17	160	0	0%	0/8

Canopy Cover

Assessment Unit	RE	Benchmark (% cover)	Site (% cover)	Benchmark Percentile	Score
Offset AU1	12.3.3	40	21.8	55%	1.5/2
Offset AU2	12.8.17	48	23.1	58%	1.5/2
Offset AU3	12.8.17	48	0	0%	0/2

Total Score Offset AU1 – 3.5/10 (MHQA 5/10)
Total Score Offset AU2 – 5.5/10 (MHQA 5/10)
Total Score Offset AU3 - 0/10 (MHQA 1/10)

Koala Shelter habitat scoring

Shelter Tree Abundance

Assessment Unit	RE	Benchmark (trees/ha)	Site Count (trees/ha)	Benchmark Percentile	Score
Offset AU1	12.3.3	115	35	30%	3/6
Offset AU2	12.8.17	160	110	69%	4.5/6
Offset AU3	12.8.17	160	0	0%	0/6

Large Trees

Assessment Unit	RE	Benchmark (trees/ha)	Site (trees/ha)	Benchmark Percentile	Score
Offset AU1	12.3.3	14	7	50%	3/4
Offset AU2	12.8.17	24	10	42%	2/4
Offset AU3	12.8.17	24	0	0%	0/4

Total Score Offset AU1 – 6/10 (MHQA 5/10)
Total Score Offset AU2 – 6.5/10 (MHQA 5/10)
Total Score Offset AU3 - 1/10 (MHQA 1/10)



Site Context (30%)

The site context characteristics for Koala are shown on **Plan 10** and summarised in **Table 36.** Scores utilised the methodology described in **Section 3.3**. and applied the impact area.

Table 36: MVOA – Koala site context scores

	AU1 (Regrowth 12.3.3)	AU2 (Regrowth 12.8.17)	AU3 (Non-remnant)
Size of patch	10	10	10
Connectedness	5	5	5
Context	5	5	5
Ecological corridors	0	0	0
Role of the site location to species overall population in the state	5	5	5
Threats to species	7	7	7
Species mobility capacity	10	10	10
Total (out of 56)	**42**	**42**	**42**
Score (out of 3)	**2.25**	**2.25**	**2.25**

Size of patch

The MVOA is connected to a patch of 500 ha therefore achieves a score of **10 out of 10** (**Plan 10**).

Connectedness

The MVOA shares 83.5% of its boundary with Koala habitat therefore achieves a score of **5 out of 5** (**Plan 10**). Surrounding Koala habitat includes vegetated areas irrespective of vegetation classification (remnant, regrowth or non-remnant) area may also include cleared paddocks where dispersal opportunities are present.

Context

Retained critical Koala habitat within a 1 km buffer of the MVOA was calculated at 75.5% and therefore achieves a score of **5 out of 5** (**Plan 13**).

Ecological corridors

While the MVOP is located partially within a Statewide corridor, this MVOA is located outside of a Statewide corridor of regional significance therefore achieves a score of **0 out of 6** (Error! Reference source not found.).

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 activity and usage across the site and the importance of habitat for fulfilling the Koala's life cycle (i.e., foraging and breeding) and thus the effect that removal of habitat would have on a local population and the species as a whole. The MVOA scored a **5 out of 5.**



Threats to species

An analysis of the scoring attributes for the site is provided the following outcomes:

- Clearing and degradation of habitat –The MVOA sits within a mosaic of agricultural land uses including large swathes of cleared land to the north and east, mapped remnant vegetation to the west and sparsely vegetated hills to the south. More than 30% of the land within a 5 km radius has been cleared therefore, a weighted score of **2.8** or 'moderate risk' is appropriate.
- Inappropriate fire regimes –A specific Bushfire Management Plan is not in place MVOA which Is mapped by the State government as having moderate-high fuel loads. Therefore, a weighted score of **2.8** or 'moderate risk' is appropriate.
- Vehicle strike – The MVOA is located in an agricultural area more than 1 km from a major road with only small local roads servicing the residents. Therefore, a weighted score of **1.5** or 'low risk' is appropriate.
- Dog attack – While not recorded during baseline surveys, wild dogs have been recorded on the broader MVOA. A number of trees are present on the site and surrounding area that would provide refuge for any koalas present. Therefore, a weighted score of **0.7** or 'moderate risk' is considered appropriate.

The site achieved a score of 8.8 out of 15 which results in a threats a score of **7 out of 15 or 'moderate risk'** as appropriate for the site.

Koala Threat Scoring Matrix (green shading indicates applicable scores for the site)

Metric	Low	Moderate	High
Threat Thresholds			
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 ≤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 ≥ 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) to protect the Koala is in effect.	Non-Koala specific BMP in effect. OR Low fuel load and low fire risk.	Site has a high fuel load and/or high fire risk.
Score Weighting	**6**	**2.8**	**0.4**
Vehicle Strike Moderate Risk	Located more than 1km from a major road AND Minor roads servicing residential or industrial areas located within 500m contain some safe design features	Located <500m from a major road with fauna safe design features) OR Located <1km from a major road accessible for koalas (minimal fauna safe design)	Located <500m from a major road with minimal fauna safe design AND Minor roads servicing residential or industrial areas are located within 500m

Metric	Low	Moderate	High
		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 site.	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	>5 and ≤10	≤5

Species mobility capacity

Species mobility capacity is a **10/10** across the three assessment units as no severe, high or moderate restrictions to movement were observed onsite.

Species Stocking Rate (40%)

Evidence of Koala was not recorded within the MVOA during field surveys, though Koala presence in the area is known from recent confirmed records.

Three (3) SATs were completed at the vegetated MHQA transects 2, 4 and 5 and returned a 'low usage' under the East Coast (med-high) activity category. SAT surveys were not completed for MHQA 1 and 3 due to a lack of trees available to conduct surveys.

The SAT surveys demonstrate that Koala utilisation of the MVOA is low, as expected given the dominance of cleared paddocks, with capacity to support ecological gain for the Koala with rehabilitation efforts. Koala are known to occur in the locality, having been recorded previously across in the broader landscape, and it is assumed that utilisation of the MVOA will increase over the lifespan of the offset as Site Condition and context improve.

The species stocking rate for Koala scored **15 out of 70** for all AUs (**Table 37**)**.** Further details on the assessment are provided below:

- No evidence of Koala was recorded within the MVOA however a small number of scats have been observed on the Mount View property outside of the MVOA, therefore 'presence detected on or adjacent to site' was assigned a score of **5 out of 10 (adjacent)** for all assessment units.
- No scats were observed within the MVOA and it consists of cleared grazing paddocks with some patches of remnant trees and little opportunity for foraging or breeding. Therefore, all AUs **5 out of 15** (dispersal).
- Results from two (2) SAT surveys completed across the MVOA found no scats which is expected given the dominance of cleared grazing paddocks. Therefore, this attribute was assigned a score of **0 out of 30** (no use).



- The MVOA is considered a potentially key source for dispersal under 'role/importance of species population on-site' therefore was scored a 5 out of 15 for all AUs.

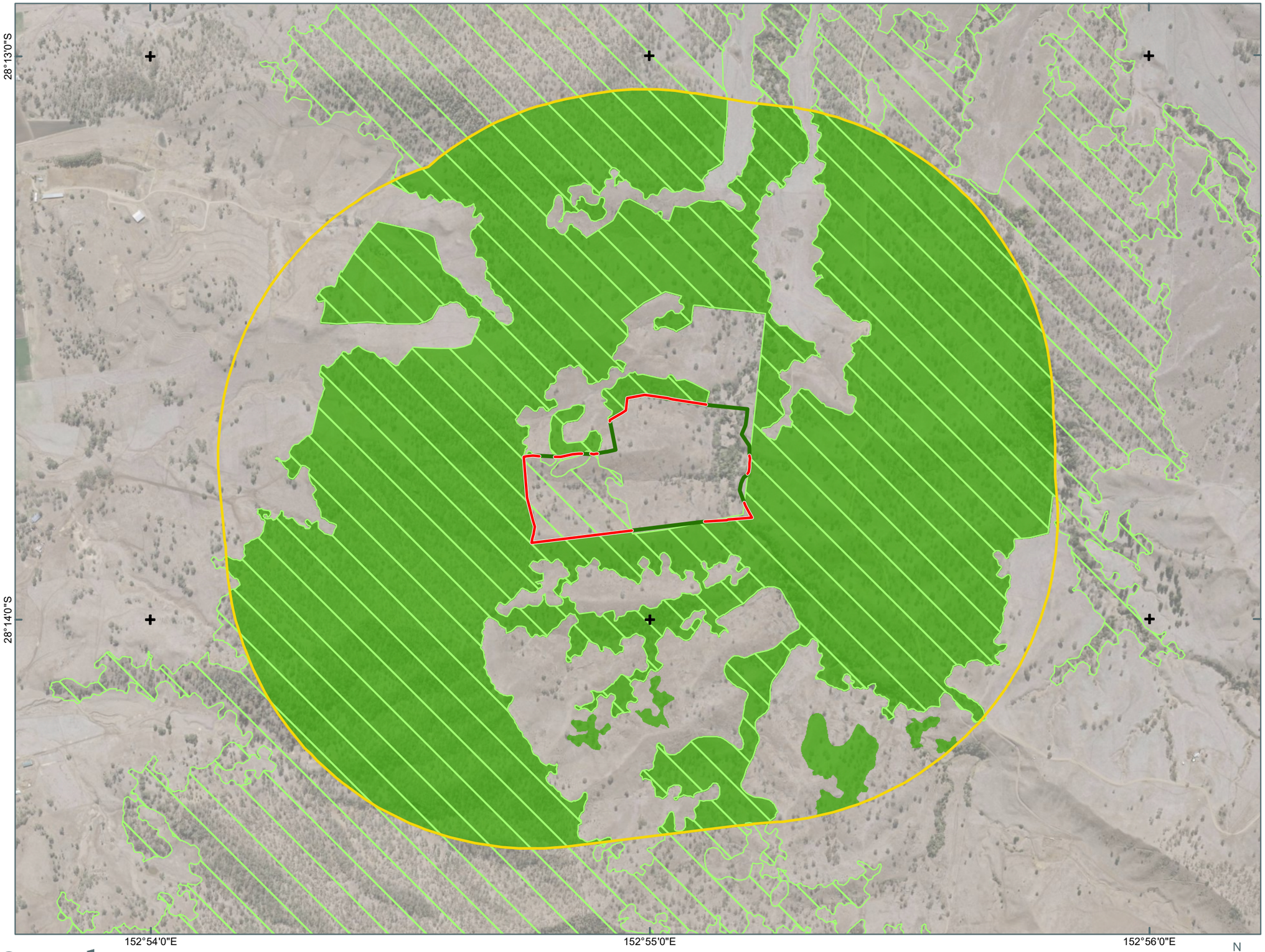
Table 37: MVOA – assessment unit Koala species stocking rate scores

	AU1	AU2	AU3
Presence detected on or adjacent to site (neighbouring property with connecting habitat) (/10)	5	5	5
Species usage of the site (habitat type and evidenced usage) (/15)	5	5	5
Approximate density (per ha) (/30)	0	0	0
Role/importance of species population on site* (/15)	5	5	5
Total species stocking rate score (/70)	15	15	15
Species stocking rate score – out of 4	0.86	0.86	0.86

*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

10. OFFSET AREA KOALA CONTEXT ASSESSMENT



Notes:
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Updated data available at

LEGEND

- Offset area
- 1km Offset area buffer
- Percentage of offset area boundary length supporting a koala critical habitat connection off and on site - 61.8%
- Percentage of Koala Critical habitat within 1km of offset area (70.7%)
- Size of Koala critical habitat patch adjoining offset area - >500ha



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6.2.5.1 Summary of Koala MVOA baseline scores

The overall habitat quality scores for Koala at the MVOA are presented in **Table 38**.

Table 38: Mount View Offset Area – Koala MHQA score summary

	AU1	AU2	AU3
Site Condition (/3)	1.46	1.49	0.41
Site context (/3)	2.25	2.25	2.25
Species stocking rate (/4)	0.86	0.86	0.86
MHQA score	**4.56 (rounded to 5)**	**4.59 (rounded to 5)**	**3.51 (rounded to 4)**

6.2.6 Grey-headed Flying-fox FHA

Utilising the FHA scoring methodology detailed in **Section 3.3.2**, the following scores have been assigned for the baseline condition of the MVOA for GHFF. Refer **Appendix B** for detailed scoring tables and **Appendix C** for raw data)

Site Condition (40%)

The Site Condition achieved a score of **1.86, 1.92** and **0.48 out of 3** for AU1, AU2 and AU3 respectively.

Site Context (30%)

The baseline site context characteristics for GHFF are shown on **Plan 11**.

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 potential GHFF habitat connected to the site in this instance. This attribute is scored such that is reflects the fact 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 impact area to be part of a patch size of larger than 500 ha. This achieved a score of **10 out of 10** (**Plan 11**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected to other populations of GHFF. Connectedness was calculated by counting the number of active GHFF camps within a 20 km radius. There is 1 active camp within recent surveys, and so the site scored a **3 out of 10** (**Plan 11**).

Context

The context attribute refers to the amount of potential GHFF habitat retained within a 20 km buffer of the proposed site and is calculated using GIS. Notably, the patch of vegetation extends over the border into New South Wales which does not use the same vegetation mapping as Queensland. Where vegetation is present in



NSW the *Grey-headed Flying-fox Foraging Habitat Vegetation Types by the NSW Department of Climate Change, Energy, the Environment and Water 2010* was used. Existing habitat within a 20 km buffer of the site was calculated at 42.5%, and therefore the context attribute achieved a score of **6 out of 10** (**Plan 11**).

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 10** was given to the Ecological Corridors component of Site Context as the site is not located within a regionally significant ecological corridor (**Plan 11**)

Role of site location to species overall population in the State

This attribute aims to quantify the importance of the site for state GHFF populations by assessing the number of notable populations within 20 km of the site and is calculated using GIS. One (1) GHFF camp has been recorded within 20 km of the site in recent surveys with a population level of 3+, and so this attribute was assigned a score of **6 out of 10** (**Plan 11**).

Threats to the species

The 'threats to the species' attribute quantifies potential risks to the survival of GHFF existing within and adjacent to the site. Key known threats to the GHFF include barbed-wire fencing and powerlines. Barbed-wire fencing is present around the permitter of the MVOA and therefore this attribute was scored a **5 out of 10** or 'moderate' threat.

Species Stocking Rate

The final component of the FHA technique is SSR. Species stocking rates are estimates of the GHFF carrying capacity of the site at the time of undertaking the survey. Stem density of GHFF foraging trees was an average of 35, 110 and 0 per ha at AU1, AU2 and AU3 and so received SSR scores of **4, 4 and 2 out of 10**, respectively.

6.2.6.1 Summary of GHFF MVOA baseline scores

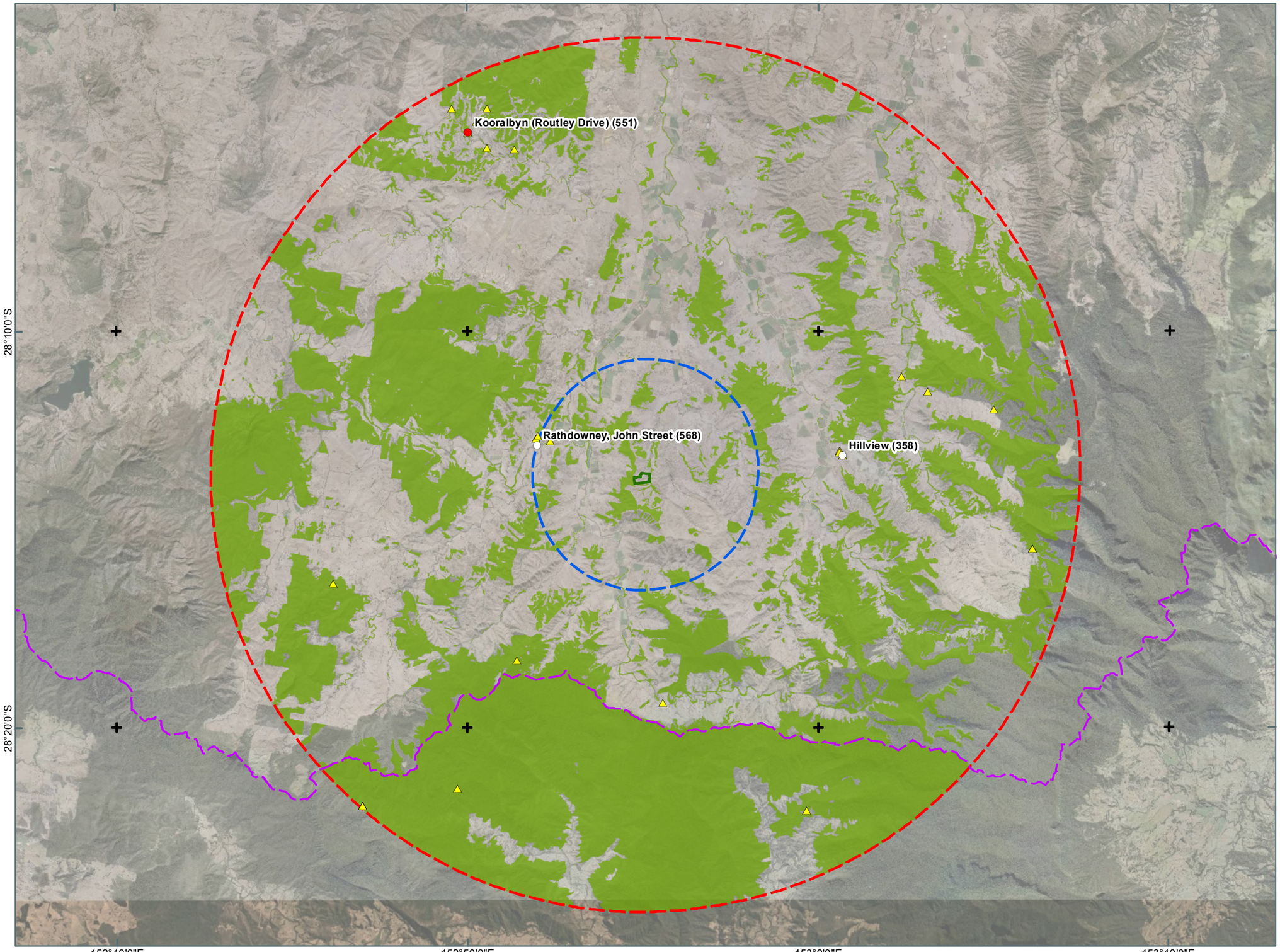
The overall habitat quality scores for GHFF at the MVOA are presented in **Table 39**.

Table 39: MVOA – GHFF FHA assessment score summary

	AU1	AU2	AU3
Site Condition (/3)	1.86	1.92	0.48
Site context (/3)	1.50	1.50	1.50
Species stocking rate (/4)	1.20	1.20	0.60
MHQA score	**4.56 (rounded to 5)**	**4.62 (rounded to 5)**	**2.58 (rounded to 3)**



11. OFFSET AREA GREY-HEADED FLYING-FOX CONTEXT ASSESSMENT



Notes:
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LEGEND

- Offset area
- QLD State Border
- 5km Offset area buffer
- 20km Offset area buffer
- Grey-headed Flying-fox records within 20km of offset area recorded (ALA, 2025) [31]
- Potential and known Grey-headed flying-fox habitat within 20km of offset area [42.5%]

GHFF Roosts (Fed. Gov., 2024)

Grey-headed Flying Fox roost inactive within recent surveys	[2]
Grey-headed Flying Fox roost active within recent surveys	[0]
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]



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11826 E 14 Offset Area GHFFCA A

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. The management objectives for the MVOA, in alignment with the Environmental Offsets Policy (EOP) will:

- Deliver an overall conservation outcome that improves the viability of habitat for the Koala and GHFF.
- Provide a direct offset that is in proportion to the level of statutory protection that applies to Koala and GHFF habitat.
- Be of a size and scale proportionate to the residual impacts on Koala and GHFF 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 MVOA.
- Detailed descriptions of the management actions to be implemented at the MVOA, including responsibilities, monitoring requirements and completion criteria, are provided in **Section 8**. Implementation of these actions will facilitate the proposed environmental outcomes and ecological uplift of habitat at the MVOA.

7.1. Koala

A summary of the baseline and improvement Modified Habitat Quality Assessment (MHQA) scoring for each Assessment Unit (AU) within the MVOA is outlined in **Table 40**. Detailed environmental outcomes showing the specific attributes which will be improved by the offset actions including interim milestones are provided at **Table 47**, **Table 48**, and **Table 49**.



Table 40: Koala baseline MHQA and offset improvement scores

MHQA final scores	AU1		AU2		AU3	
	Baseline	**Uplift**	**Baseline**	**Uplift**	**Baseline**	**Uplift**
Site Condition (/3)	1.52	2.70	1.49	2.70	0.57	2.55
Site context (/3)	2.25	2.25	2.25	2.25	2.25	2.25
Species stocking rate (/4)	0.86	2.29	0.86	2.29	0.86	2.29
AU score	4.62	7.24	4.59	7.24	3.68	7.09
Rounded	**5**	**7**	**5**	**7**	**4**	**7**
AU Area (ha)	**3.2**		**1.2**		**20.6**	

7.2. Grey-headed Flying-fox

A summary of the Foraging Habitat Assessment (FHA) baseline and improvement scoring for each assessment unit within the MVOA is outlined in **Table 41**. Detailed environmental outcomes showing the specific attributes which will be improved by the offset actions including interim milestones are provided at **Table 50**, **Table 51**, and **Table 52.**

Table 41: GHFF baseline FHA and offset improvement scores

FHA final scores	AU1		AU2		AU3	
	Baseline	Uplift	Baseline	Uplift	Baseline	Uplift
Site Condition (/3)	1.86	3.92	1.92	3.92	0.48	3.92
Site context (/3)	1.50	1.50	1.50	1.50	1.50	1.50
Species stocking rate (/4)	1.20	2.40	1.20	2.40	0.60	1.80
AU score	4.56	7.82	4.62	7.82	2.58	7.22
Rounded	**5**	**8**	**5**	**8**	**3**	**7**
AU Area (ha)	**5.7**		**1.8**		**17.5**	



7.3. Offset Assessment Guide – Calculator

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. A summary of EPBC OAG calculator inputs for Koala and GHFF are included in **Table 42** and **Table 43** below respectively. Refer to **Appendix D** for the detailed EPBC offset calculator sheets and attribute justifications.

Table 44 and
Table 45 outline a summary of the MNES offset compensation associated with the impacts, being **116.08%** for Koala and **116.56%** for GHFF respectively.

Table 42: Offset Assessment Guide Parameters – Koala

Parameter	Rationale
Impact (Area)	7.38 ha for Koala
Quantum of Impact (Quality)	A score of 6 for Koala
Quantum Impact (Area)	4.43 ha
Risk Related Time Horizon	The proposed MVOA will be legally secured in perpetuity; hence, the maximum score of 20 years.
Time Until Ecological Benefit	Measures prescribed in this MVOA Management Plan are expected to achieve the predicted increase in habitat quality over a period of 20 years. This timeframe is broadly recognised for regrowth vegetation to meet remnant status (50% canopy cover and 70% canopy height, Neldner et al. 2023).
Start Area	25 ha
Start Quality	Refer **Table 44**
Risk of Loss without Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Risk of Loss with Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Confidence in Result (Risk of Loss)	As risk of loss is set at 0%, confidence in result is not applicable.
Future Quality without Offset	Existing habitat quality is expected to be maintained or potentially reduce if the current land use / management regime is continued. Under management for grazing over 20 years and without the offset, current habitat quality for Koala is highly unlikely to improve, and some attributes are likely to deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes. Refer **Table 44**.
Future Quality with Offset	Refer **Table 44**.
Confidence in Result (Future Quality)	Confidence in the success of the offset is 85% across all Assessment Units. These confidence results are considered appropriate given the intensity of site works, use of established best practice management techniques, high level of detail provided (i.e. the detailed rehabilitation plan) and conservative outcomes used to identify uplift scores.



Table 43: Offset Assessment Guide Parameters – Grey-headed Flying-fox

Parameter	Rationale
Impact (Area)	7.38 ha for GHFF
Quantum of Impact (Quality)	A score of 7 for GHFF
Quantum Impact (Area)	5.16 ha
Risk Related Time Horizon	The proposed MVOA will be legally secured in perpetuity; hence, the maximum score of 20 years.
Time Until Ecological Benefit	Measures prescribed in this MVOA Management Plan are expected to achieve the predicted increase in habitat quality over a period of 20 years. This timeframe is broadly recognised for regrowth vegetation to meet remnant status (50% canopy cover and 70% canopy height, Neldner et al. 2023).
Start Area	25 ha
Start Quality	Refer **Table** 45**.**
Risk of Loss without Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Risk of Loss with Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Confidence in Result (Risk of Loss)	As risk of loss is set at 0%, a high score of 90% is used for confidence in result.
Future Quality without Offset	Existing habitat quality is expected to be maintained or potentially reduce if the current land use / management regime is continued. Under management for grazing over 20 years and without the offset, current habitat quality for GHFF is highly unlikely to improve, and some attributes are likely to deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes. Refer **Table** 45.
Future Quality with Offset	Refer **Table** 45**.**
Confidence in Result (Future Quality)	A confidence of 85% is considered suitable for AUs across the site that contain existing vegetation (AU1 and AU2). A reduced confidence of 75% is considered suitable for cleared AUs (AU3) given the rehabilitation works that will occur.



Table 44: Summary of Koala offset compensation

Impact site			Mount View Offset Area									
Impact area	Impact score	Quantum Impact area	Habitat quality gain (/10)			MVOA (ha)			Impact offset (%)			Total % of impact offset
			AU1	AU2	AU3	AU1	AU2	AU3	AU1	AU2	AU3	
7.38	6	4.43	5 to 7	5 to 7	4 to 7	3.2	1.2	20.6	9.68	3.93	93.45	106.76

Table 45: Summary of Grey-headed Flying-fox offset compensation

Impact site			Mount View Offset Area									
Impact area	Impact score	Quantum Impact area	Habitat quality gain (/10)			MVOA (ha)			Impact offset (%)			Total % of impact offset
			AU1	AU2	AU3	AU1	AU2	AU3	AU1	AU2	AU3	
7.38	7	5.16	5 to 8	5 to 8	3 to 7	3.2	1.2	20.6	15.18	5.69	114.9	135.81

7.3.1 Completion Criteria

The management framework is designed to achieve the proposed environmental outcomes summarised above and detailed in **Section 8**. A summary of management actions and associated completion criteria required to achieve the environmental outcomes are provided in **Table 46**. 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.

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

a) **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
b) **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.

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 8.9.4**.



Table 46: Completion criteria and performance targets

Management action	OMP section	Performance targets	Completion criteria
1 – Legally secure MVOA	**8.3**	Not applicable	• The MVOA will be legally secured prior to commencement of the action via a Voluntary Declaration (VDEC) administered under the *Vegetation Management Act 1999* (Qld). • A covenant will be completed within 12 months of commencement of the action under either Chapter 6 Part 4 Division 8A of the Land Act 1994 (Qld) or Part 6 Division 4A of the Land Titles Act 1994 (Qld). If a covenant isn't possible an alternative legally binding mechanism will utilised in consultation with DCCEEW. • The Department is notified of the legal securement within 5 business days of commencing the implementation of the OMP i.e., the date from which the MVOA is legally secured. • The MVOA is not used for other purposes – site access is restricted.
2 – Non-native vertebrate pest management	**8.4**	• 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 Year 1 of the offset. • A suitably qualified pest management contractor will be engaged to manage pests within the MVOA for the life of the offset.	• Reduce risk of injury or death of Koala from non-native predator attacks within the MVOA. • No evidence of non-native vertebrate pests recorded within the MVOA as a result of property wide pest management.

Management action	OMP section	Performance targets	Completion criteria
3 – Weeds of National Significance management	**8.5**	• Establish photo monitoring locations in Year 1 of the OMP prior to treatment of Weeds of National Significance (WONS) commencing. • All WONS will receive initial treatment within Year 1 of the offset to allow for planting works to commence. • Follow-up treatment of WONS will occur annually or as required, determined by the suitably qualified regeneration contractor.	• The management actions must reduce the extent of, or maintain, WONS weed cover below 5% of the entire MVOA by the end of Year 10 of the offset and be maintained for the life of the offset.
4 – Bushfire Management Plan	**8.6**	• A Bushfire Management Plan (BMP) will be developed within 1 year from the date of the approval and implemented in accordance with relevant Queensland guidelines and endorsed by an experienced bushfire practitioner to reduce potential threats from fires to Koala.	• Reduced risk of high intensity fires in the MVOA. • Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes. • Firebreaks and fuel loads are maintained through the life of the offset.
5 – Habitat creation and regeneration	**8.7**	• MVOA planting completed by the end of Year 2 of the offset.	• 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 expected cover according to the relevant Regional Ecosystem benchmark to be reached. • Site Condition metrics for Koala improves in accordance with environmental outcomes provided in **Table 47**, **Table 48** and **Table 49.** • Site Condition metrics for GHFF improves in accordance with environmental outcomes provided in **Table 50**, **Table 51** and **Table 52**.

Management action	OMP section	Performance targets	Completion criteria
6 – Fencing and signage	**8.8**	• Fencing and signage is installed and retrofitted by the end of Year 1 of the offset and maintained for the life of the offset. • Prevention of livestock from the entering the MVOA utilising fauna friendly livestock exclusion fencing.	• Mortalities or injury to Koala and GHFF recorded as a result of fauna friendly barbed-wire fencing is rectified within 2 weeks of being recorded. • Stock breaches or unauthorised access is rectified as soon as possible once identified with cattle or other stock removed from active rehabilitation zones immediately. • Fence repairs must be completed within 2 weeks of being recorded unless delayed by severe weather or other safety concerns.

Table 47: Koala environmental outcomes – AU1

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	3	3	5	5	5	10 years	Recruitment of woody perennial species is expected to be greater than 75% of the benchmark by year 10 as a result of management actions 1, 3, 4 & 5 outlined in **Table 46**.	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.	It is anticipated that the recruitment of woody perennial species will increase to over 75% by year 10. If not above 75% by year 10 remedial actions to be implemented including infill planting.
Native plant species richness – Trees	5	5	5	5	5	Immediate	Native plant species richness already at maximum score and will be maintained as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 240%. Remedial actions not required
Native plant species richness - Shrubs	0	2.5	2.5	5	5	5 years partial 15 years full	All of the expected shrub species to be present as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 20% of the benchmark. If the shrub species richness has not improved to greater than 25% at 5 years then remedial actions to improve the prospect of achieving 90% in 15 years will be applied. These include remedial plantings.
Native plant species richness - Grasses	2.5	2.5	2.5	2.5	5	20 years	All of the expected grass species to be present as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 27.78% of the benchmark. If the grass species richness has not improved to greater than 75% 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	10 years partial 20 years full	Native forb species richness greater than 90% of the benchmark will be achieved as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 4% 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 has currently been achieved	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Median tree canopy height is currently at 76% (Ecologically Dominant Layer [EDL]) and 100% (sub-canopy) of the benchmark. Tree canopy height will be maintained above 70% at 20 years.
Tree canopy cover	5	5	5	5	5	Immediate	Average tree canopy cover currently between 50% and 200% of the benchmark.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree canopy cover is currently at 54.5% (EDL) and 68.3% (sub-canopy) of the benchmark. EDL canopy cover is to be maintained between 50 and 200%.

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
Shrub canopy cover	0	0	3	3	5	10 years partial 20 years full	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 0% of the benchmark. If the shrub canopy cover has not improved to greater than 10% at 10 years, then remedial actions to 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 be maintained at greater than 90% of the benchmark by specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Native perennial grass cover is currently at 131.73% of the benchmark. If monitoring indicates a decline to below 90% 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 between 50% and 200% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 is not above 50% by year 15 then remedial actions will be implemented such as infill planting to increase the prospect of achieving >50% by year 20
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, 3, 4 & 5 outlined in **Table 46.**	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 the number of large trees will be maintained between 0% and 50%. Remedial actions are not anticipated as actions cannot increase the number of large trees.
Coarse woody debris	2	2	2	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, 3, 4 & 5 outlined in **Table 46.**	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 16.16% of the benchmark. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% by Year 10 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	5	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 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 11.5% of the benchmark. If improvement to below 10% has not been achieved by the end of Year 10 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	5	5	5	5	10	20 years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46.**	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.	Quality and availability of food and foraging habitat is currently moderate based on existing attribute scores. All Site Condition remedial actions also apply to this criterium achieving a high rating.

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
Quality and availability of shelter	5	5	5	5	10	20 years	Quality and availability of shelter will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46**.	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.	Quality and availability of shelter is currently moderate based on existing site attribute scores. All Site Condition remedial actions also apply to this criterium achieving a high rating.
Site Condition Score	**50.5**	**53**	**65.5**	**68**	**90**				
Overall Site Condition Score out of 3	**1.46**	**1.59**	**1.97**	**2.04**	**2.70**				
Size of patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	5	5	5	5	5	NA	NA	NA	NA
Context	5	5	5	5	5	NA	NA	NA	NA
Ecological Corridors	0	0	0	0	0	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	7	7	7	7	Immediate	Threats to species will be maintained at low levels by specific management actions 2, 3 & 6 outlined in **Table 46.**	Baseline attributes are established. This criterium is reliant upon the suppression and control of pest species and WONS. Pest monitoring will be evaluated as per the pest management program.	If monitoring as per the pest management program indicates pest species are recorded within the MVOA, then corrective actions will be implemented to supress threats across the MVOA.
Species mobility capacity	10	10	10	10	10	Immediate	Species mobility capacity will be maintained to minor restriction (<25%) by specific management actions 1 to 6 outlined in **Table 46.**	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.	All Site Condition remedial actions, as well as threat reductions also apply to this criterium maintaining a high rating.
Site Context Score	**42**	**42**	**42**	**42**	**42**				
Overall Site Context Score (out of 3)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**				
Presence	5	5	5	10	10	15 years	It is anticipated that under the management actions 1 through 6 outlined in **Table 46** Koala will move from adjacent areas into the offset site.	Koala Spot Assessment Technique (SAT) surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Koala presence was detected on site during baseline surveys. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.
Usage	5	5	5	15	15	15 years	It is anticipated that under management actions 1 to 6 outlined in **Table 46** Koala usage as a measure of habitat type and evidence of usage will increase.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	AU1 on-site is considered breeding habitat due to usage and trees. With the re-instatement of habitat, it is anticipated that breeding habitat will be maintained within AU1.

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
Approximate Density	0	0	0	10	10	15 years	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 46** at least low level Koala activity (non-zero scats recorded using the East Coast med-high population category) will occur	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Baseline SAT surveys did record the presence of Koala on site. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.
Role of the population	5	5	5	5	5	Immediate	NA - Not anticipated to change	Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	NA - Not anticipated to change
Species Stocking Rate [SSR] Score out of 70	**15**	**15**	**15**	**40**	**40**				
SSR Score out of 4	**0.86**	**0.86**	**0.86**	**2.29**	**2.29**				
Total Habitat Quality Scores	**4.56**	**4.64**	**5.32**	**6.90**	**7.24**				

Table 48: Koala environmental outcomes – AU2

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	3	3	5	5	5	10 years	Recruitment of EDL dominant species will increase to >75% as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46**.	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 33% of the benchmark. If improvement to greater than 75% has not been achieved at the 10-year mark, then 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	Native tree species richness greater than 90% of the benchmark will be maintained as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Native tree richness is currently at 85.71%. If richness has not increased to greater than 90% by year 10 then remedial actions will be implemented which includes infill planting.
Native plant species richness - Shrubs	2.5	2.5	2.5	5	5	15 years	Native shrub species richness greater than 90% of the benchmark will be maintained as a result of management actions 1, 3, 4 & 5 outlined in **Table 46**.	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 60% of the benchmark. If the shrub species richness has not improved to greater than 80% at Year 10 then remedial actions to improve the prospect of achieving 90% in 15 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, 3, 4 & 5 outlined in **Table 46**.	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 25% of the benchmark. If monitoring indicates that grass species richness is not transitioning to over 90% at Year 15 then remedial actions will be applied to improve the prospect of achieving 90% by Year 20. These include remedial plantings.
Native plant species richness - Forbs	2.5	2.5	2.5	2.5	5	20 years	Native forb species richness greater than 90% of the benchmark will be achieved as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 33.33% 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 has currently been achieved	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Median tree canopy height is currently at 94.74% (Ecologically Dominant Layer [EDL]) and 80% (sub-canopy) of the benchmark. Tree canopy height will be maintained above 70% at 20 years.
Tree canopy cover	3.5	3.5	3.5	5	5	15 years	Tree canopy cover between 50% and 200% of the benchmark will be maintained as a result of management actions 1, 3, 4 & 5 outlined in **Table 46**.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree canopy cover is currently 48.13% (EDL) and 74% (sub-canopy). If monitoring indicates that canopy cover is not between greater than 50% at year 10 then remedial actions will be applied to improve prospects of achieving between 50 and 200% by Year 20. These include remedial plantings.

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	0	0	3	3	5	10 years partial 20 years full	Shrub canopy cover between 50% and 200% of the benchmark will be achieved as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46**.	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 0% of the benchmark. If monitoring indicates that shrub canopy cover is not between 10 and 50% at year 10 then remedial actions will be applied to improve prospects of achieving between 50 and 200% by Year 20. These include remedial plantings.
Native perennial grass cover	5	5	5	5	5	Immediate	Native perennial grass cover is currently greater than 90% of the benchmark and will be maintained as a result of management actions 1, 3, 4 & 5 outlined in **Table 46**.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Native perennial grass cover is currently at 168.75% of the benchmark and will be maintained greater than 90%.
Organic litter	3	3	3	3	5	20 years	Organic litter is to be between 50% and 200% of the benchmark as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 is currently at 23.81% of the benchmark. If organic litter has not improved to greater than 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 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, 3, 4 & 5 outlined in **Table 46.**	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 the number of large trees will be maintained between 0% and 50%. Remedial actions are not anticipated.
Coarse woody debris	0	0	2	2	5	10 years partial 20 years full	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved by specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 6.41% of the benchmark. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% by Year 10 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	5	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% at 10 years by specific management actions 3 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 10% of the benchmark. If improvement to below 5% has not been achieved by the end of Year 10 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	5	5	5	5	10	20 years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46**.	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	5	5	5	5	10	20 years	Quality and availability of shelter will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46.**	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	**49.5**	**49.5**	**64**	**68**	**90**				

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
Overall Site Condition Score out of 3	**1.49**	**1.49**	**1.92**	**2.04**	**2.70**				
Size of patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	5	5	5	5	5	NA	NA	NA	NA
Context	5	5	5	5	5	NA	NA	NA	NA
Ecological Corridors	0	0	0	0	0	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	7	7	7	7	Immediate	Threats to species will be maintained at low levels by specific management actions 2, 3 & 6 outlined in **Table 46.**	Baseline attributes are established. This criterium is reliant upon the suppression and control of pest species and WONS. Pest monitoring will be evaluated as per the pest management program.	If monitoring as per the pest management program indicates pest species are recorded within the MVOA, then corrective actions will be implemented to supress pests across the MVOA.
Species mobility capacity	10	10	10	10	10	Immediate	Species mobility capacity will be maintained to minor restriction (<25%) by specific management actions 1 to 6 outlined in **Table 8**.	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.	All Site Condition remedial actions, as well as threat reductions also apply to this criterium maintaining a high rating.
Site Context Score	**42**	**50**	**50**	**50**	**50**				
Overall Site Context Score (out of 3)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**				
Presence	5	5	5	10	10	15 years	It is anticipated that under the management actions 1 through 6 outlined in **Table 46** Koala will move from adjacent areas into the offset site.	Koala Spot Assessment Technique (SAT) surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Koala presence was detected on site during baseline surveys. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.
Usage	5	5	5	15	15	15 years	It is anticipated that under management actions 1 to 6 outlined in **Table 46** Koala usage as a measure of habitat type and evidence of usage will increase.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	AU1 on-site is considered breeding habitat due to usage and trees. With the re-instatement of habitat, it is anticipated that breeding habitat will be maintained within AU1.
Approximate Density	0	0	0	10	10	15 years	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 46** at least low level Koala activity (non-zero scats recorded using the East Coast med-high population category) will occur	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Baseline SAT surveys did record the presence of Koala on site. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.
Role of the population	5	5	5	5	5	Immediate	NA - Not anticipated to change	NA - Not anticipated to change	NA - Not anticipated to change
SSR Score out of 70	**15**	**15**	**15**	**40**	**40**				
SSR Score out of 4	**0.86**	**0.86**	**0.86**	**2.29**	**2.29**				
Total Habitat Quality Scores	**4.60**	**4.60**	**5.35**	**7.08**	**7.24**				

Table 49: Koala environmental outcomes – AU3

AU3 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 at 100% as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 his drops below 90% 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	0	2.5	2.5	5	5	15 years	Native tree species richness is to be greater than 90% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46**.	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 21.43% of the benchmark. Tree species richness is to be greater than 75% at 15 years. 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 >90% tree species richness in 15 years will be applied. These include remedial plantings of advanced stock.
Native plant species richness - Shrubs	2.5	2.5	2.5	5	5	15 years	Greater than 90% of benchmark shrub species to be present as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 30% of the benchmark. If the shrub species richness has not improved to greater than 75% at 10 years then remedial actions to improve the prospect of achieving 90% in 15 years will be applied. These include remedial plantings.
Native plant species richness - Grasses	0	0	0	2.5	5	15 years	Greater than 90% of benchmark grass species to be present as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 16.67% of the benchmark. If the grass species richness has not improved to greater than 75% at 10 years, then remedial actions to improve the prospect of achieving 90% in 15 years will be applied. These include remedial plantings.
Native plant species richness - Forbs	0	0	0	2.5	5	20 years	Native forb species richness greater than 90% of the benchmark will be achieved as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 5.56% of the benchmark. If the forb 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.
Tree canopy height	1.5	1.5	1.5	3	5	20 years	A median tree height greater than 70% of the benchmark will be achieved as a result of 1, 3, 4 & 5 outlined in **Table 46**.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Median tree canopy height is currently at 63.16% (EDL) and 0% (sub-canopy) of the benchmark. If tree height has not transitioned above 70% at 20 years, then the prospect of extending the management period will be investigated. By Year 20 species plantings to be a minimum of 70% of the tree canopy height benchmark.

AU3 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
Tree canopy cover	0	0	2	2	5	20 years	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 55, 10, 15 and 20 years.	Tree canopy cover is currently at 0% (EDL) and 0% (sub-canopy) of the benchmark. If tree canopy cover is not greater than 30% at 10 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	0	0	3	5	5	10 years partial 15 years full	Canopy cover to be between 50% and 200% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 0% of the benchmark. If the shrub canopy cover has not improved to greater than 40% at 10 years then remedial actions to improve the prospect of achieving between 50% and 200% in 15 years will be applied. These include remedial plantings.
Native perennial grass cover	5	5	5	5	5	Immediate	Native grass cover to be maintained at >90% of the benchmark by specific management actions 1, 3, 4 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Native perennial grass cover is currently at 270% of the benchmark. If monitoring indicates a decline to below 90% then remedial actions will be applied. These include refining weed and fire control methods to ensure native grass cover is maintained.
Organic litter	0	0	3	3	5	10 years partial 20 years full	Organic litter to be between 50% and 200% of the benchmark as a result of specific management actions 1, 3, 4 & 5 outlined in **Table 46**.	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 is currently at 0% of the benchmark. If organic litter has not improved to 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	0	0	0	0	0	Immediate	The number of large trees will be maintained between 0% and 50% of the benchmark as a result of management actions 1, 3, 4 & 5 outlined in **Table 46.**	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 the number of large trees will be maintained between 0% and 50%. Remedial actions are not anticipated.
Coarse woody debris	0	0	2	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, 3, 4 & 5 outlined in **Table 46**.	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 1.07% of the benchmark. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% by year 10 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	3	5	5	10	20 Years	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3 & 5 outlined in **Table 46.**	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 26% of the benchmark. If improvement to below 10% has not been achieved by the end of Year 10 then then remedial actions to reduce weed cover will be

AU3 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
									applied. These include refining weed control methods.
Quality and availability of food and foraging habitat	1	1	5	5	10	20 Years	Quality and availability of food and foraging habitat will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46.**	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.	Quality and availability of food and foraging habitat is currently poor. All Site Condition remedial actions also apply to this criterium achieving a high rating.
Quality and availability of shelter	1	1	5	5	10	20 Years	Quality and availability of shelter will be improved to high by specific management actions 1, 4 and 5 outlined in **Table 46.**	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.	Quality and availability of shelter is currently poor. All Site Condition remedial actions also apply to this criterium achieving a high rating.
Site Condition Score	**19**	**21.5**	**41.5**	**55**	**85**				
Overall Site Condition Score out of 3	**0.57**	**0.65**	**1.25**	**1.65**	**2.55**				
Size of patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	5	5	5	5	5	NA	NA	NA	NA
Context	5	5	5	5	5	NA	NA	NA	NA
Ecological Corridors	0	0	0	0	0	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	7	7	7	7	Immediate	Threats to species will be maintained at low levels by specific management actions 2, 3 & 6 outlined in **Table 46.**	Baseline attributes are established. This criterium is reliant upon the suppression and control of pest species and WONS. Pest monitoring will be evaluated as per the pest management program.	If monitoring as per the pest management program indicates pest species are recorded within the MVOA, then corrective actions will be implemented ti supress pests across the MVOA.
Species mobility capacity	10	10	10	10	10	Immediate	Species mobility capacity will increase in parts of the offset site that are completely cleared (AU3) by specific management actions 1 to 6 outlined in **Table 8**.	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.	All Site Condition remedial actions, as well as threat reductions also apply to this criterium.
Site Context Score	**42**	**42**	**42**	**42**	**42**				
Overall Site Context Score (out of 3)	**2.25**	**2.25**	**2.25**	**2.25**	**2.25**				
Presence	5	5	5	10	10	15 years	It is anticipated that under the management actions 1 through 6 outlined in **Table 46** Koala will move from adjacent areas into the offset site.	Koala Spot Assessment Technique (SAT) surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Koala presence was detected on site during baseline surveys. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.

AU3 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
Usage	5	5	5	15	15	15 years	It is anticipated that under management actions 1 to 6 outlined in **Table 46** Koala usage as a measure of habitat type and evidence of usage will increase.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	AU1 on-site is considered breeding habitat due to usage and trees. With the re-instatement of habitat, it is anticipated that breeding habitat will be maintained within AU1.
Approximate Density	0	0	0	10	10	15 years	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 46** at least low level Koala activity (non-zero scats recorded using the East Coast med-high population category) will occur	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Baseline SAT surveys did record the presence of Koala on site. It is anticipated that the presence of Koala on site will continue be detected by the end of Year 20.
Role of the population	5	5	5	5	5	Immediate	NA - Not anticipated to change	Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	NA - Not anticipated to change
SSR Score out of 70	**15**	**15**	**15**	**40**	**40**				
SSR Score out of 4	**0.86**	**0.86**	**0.86**	**2.29**	**2.29**				
Total Habitat Quality Scores	**3.59**	**3.74**	**4.55**	**6.94**	**7.09**				

Table 50: Grey-headed Flying-fox environmental outcomes – AU1

Assessment Unit - Regional Ecosystem	**AU 1 – Regrowth 12.3.3**											
Site Reference	Transect 2 Raw Data	Transect 4 Raw Data	Max Score	Average score	AU Score	Year 5 Score	Year 10 Score	Year 15 Score	Year 20 Score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	10	10	**20**	**10**	**10**	**10**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** AU1 vegetation will attain Remnant status as defined under the Vegetation Management Act within 15 years.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	AU1 vegetation is to reach Remnant status in 15 years, which require 70% of height and 50% of expected cover to be reached. If the vegetation is not progressing toward Remnant status at Year 10, remedial actions will be applied. These include remedial plantings of advanced stock.
Species Richness	3	2	**20**	**2.5**	**5**	**5**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** the assessment unit 'Species Richness' will be improved to greater than six foraging species.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species richness within the assessment unit is to be improved to greater than six foraging species. If the species diversity is not progressing towards this by year 10, then remedial actions will be applied. These include remedial plantings of advanced stock.
Flower Score	0.500	0.813	**10**	**0.6565**	**8**	**8**	**8**	**8**	**8**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** 'Flower Score' will improve to ten by year 15.	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 expected that 'Flower Score' will be maintained at current score.
Timing of Biological Shortages	8.5	8.5	**10**	**8.5**	**8.5**	**8.5**	**9**	**10**	**10**	It is not anticipated that the timing of biological shortages will decline.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	The planting of additional species inline with the RE will increase the 'timing of biological shortages.'
Quality of Foraging Habitat	1	2	**20**	**1.5**	**5**	**5**	**10**	**20**	**20**	It is expected that management actions 1, 3, 4 & 5 outlined in **Table 46** will result in an improvement to at least four significant food tree species being established by Year 10 and greater than six by Year 15.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat within AU1 is to achieve at least four species by Year 10, and greater than six by Year 15. If the species present do not reflect this requirement at Year 10, then remedial actions will be applied including plantings of advanced stock.
Non-native Plant Cover	8%	15%	**20**	**11.5%**	**10**	**10**	**20**	**20**	**20**	Non-native Plant Cover' is currently high within AU1. It is anticipated that actions 3 & 5 outlined in **Table 46** will improve non-native plant cover to below 5% within 10 years.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If improvement to 5% has not been achieved at 10 years then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score					**46.5**	**46.5**	**67**	**98**	**98**			
MAX Site Condition Score					**100**	**100**	**100**	**100**	**100**			
Site Condition Score - out of 4					**1.86**	**1.86**	**2.68**	**3.92**	**3.92**			
Size of patch	Patch size is greater than 500 ha	Patch size is greater than 500 ha	**10**	**10**	**10**	**10**	**10**	**10**	**10**	NA	NA	NA

Assessment Unit - Regional Ecosystem	**AU 1 – Regrowth 12.3.3**											
Connectedness	1 active camp within 20 kilometres (km)	1 active camp within 20 km	**10**	**3**	**3**	**3**	**3**	**3**	**3**	NA	NA	NA
Context	31-75%	31-75%	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Ecological Corridors	Not within ecological corridor	Not within ecological corridor	**10**	**0**	**0**	**0**	**0**	**0**	**0**	NA	NA	NA
Role of site location to species overall population in the state	1 active Level 3 roost within 20 km	1 active Level 3 roost within 20 km	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Threats to the species	Moderate (barbed wire fencing)	Moderate (barbed wire fencing)	**10**	**5**	**5**	**5**	**5**	**5**	**5**	The proposed offset site is currently fenced with barbed wire, a recognised threat to Flying-foxes. Management action 6 outlined in **Table 46** will retrofit barbed wire.	Baseline attributes have been established. This criterium is reliant upon the management of barbed wire fencing.	The removal of barbed wire will provide a reduction in threats however for the purposes of scoring outcomes. The threat score is maintained at 5.
Site Context Score					**30**	**30**	**30**	**30**	**30**			
MAX Site Context Score					**60**	**60**	**60**	**60**	**60**			
Site Context Score - out of 3					**1.5**	**1.5**	**1.5**	**1.5**	**1.5**			
GHFF Foraging Tree Density / ha	35	35	**10**	**35**	**4**	**4**	**4**	**6**	**8**	Natural assisted regeneration and plantings as per management actions 1, 3, 4 & 5 outlined in **Table 46** will improve stem densities of GHFF foraging trees within AU1 to greater than 315 per ha by Year 15 and 533 by Year 20.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Stem density within AU1 is to achieve at 150 per ha by Year 15 and 253 by Year 20. If the stem density is not progressing towards this by Year 5 then remedial actions will be applied. These include remedial plantings of advanced stock.
Species Stocking Rate Score					**4**	**4**	**4**	**6**	**8**			
MAX Species Stocking Rate Score					**10**	**10**	**10**	**10**	**10**			
Species Stocking Rate Score - out of 3					**1.2**	**1.2**	**1.2**	**1.8**	**2.4**			
Total					**4.56**	**4.56**	**5.38**	**7.22**	**7.82**			

Table 51: Grey-headed Flying-fox environmental outcomes – AU2

Assessment Unit - Regional Ecosystem	**AU 2 – Regrowth 12.8.17**										
Site Reference	Transect 5 Raw Data	Max Score	Average Score	AU Score	Year 5 Score	Year 10 Score	Year 15 Score	Year 20 Score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	10	**20**	**10**	**10**	**10**	**10**	**20**	**20**	It is not anticipated that the vegetation status will decline.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Although unexpected, if the vegetation status shows decline then remedial actions will be implemented.
Species Richness	3	**20**	**3**	**5**	**15**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** the assessment unit 'Species Richness' will be improved to greater than six foraging species by Year 10.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species richness within AU2 is to be improved to greater than six foraging species by Year 10. If the species diversity is not progressing towards this by Year 5, then remedial actions will be applied. These include remedial plantings of advanced stock.
Flower Score	0.575	**10**	**0.575**	**8**	**8**	**8**	**8**	**8**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** 'Flower Score' will improve to ten by Year 15.	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 expected that 'Flower Score' will be maintained.
Timing of Biological Shortages	10	**10**	**10**	**10**	**10**	**10**	**10**	**10**	It is not anticipated that the timing of biological shortages will decline.	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 the timing of biological shortages will be maintained
Quality of Foraging Habitat	2	**20**	**20**	**5**	**5**	**10**	**20**	**20**	It is expected that management actions 1, 3, 4 & 5 outlined in **Table 46** will result in an improvement to at least four significant food tree species being established by Year 10 and greater than six by Year 15.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat within AU1 is to achieve at least four species by Year 10, and greater than six by Year 15. If the species present do not reflect this requirement at Year 10, then remedial actions will be applied including plantings of advanced stock.
Non-native Plant Cover	10%	**20**	**10%**	**10**	**10**	**20**	**20**	**20**	Non-native Plant Cover' is currently high within AU1. It is anticipated that actions 3 & 5 outlined in **Table 46** will improve non-native plant cover to below 5% within 10 years.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If improvement to 5% has not been achieved at 10 years then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score				**48**	**48**	**68**	**98**	**98**			
MAX Site Condition Score				**100**	**100**	**100**	**100**	**100**			
Site Condition Score - out of 4				**1.92**	**1.92**	**2.72**	**3.92**	**3.92**			
Size of patch	Patch size is greater than 500 ha	**10**	**10**	**10**	**10**	**10**	**10**	**10**	NA	NA	NA

Assessment Unit - Regional Ecosystem	**AU 2 – Regrowth 12.8.17**									
Connectedness	1 active camp within 20 kilometres (km)	**10**	**3**	**3**	**3**	**3**	**3**	**3**	NA	NA	NA
Context	31-75%	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Ecological Corridors	Not within ecological corridor	**10**	**0**	**0**	**0**	**0**	**0**	**0**	NA	NA	NA
Role of site location to species overall population in the state	1 active Level 3 roost within 20 km	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Threats to the species	Moderate (barbed wire fencing)	**10**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	The proposed offset site is currently fenced with barbed wire, a recognised threat to Flying-foxes. Management action 6 outlined in **Table 46** will retrofit barbed wire.	The removal of barbed wire will provide a reduction in threats however for the purposes of scoring outcomes. The threat score is maintained at 5.
Site Context Score				**30**	**30**	**30**	**30**	**30**			
MAX Site Context Score				**60**	**60**	**60**	**60**	**60**			
Site Context Score - out of 3				**1.50**	**1.50**	**1.50**	**1.50**	**1.50**			
GHFF Foraging Tree Density / ha	110	**10**	**110**	**4**	**4**	**4**	**6**	**8**	Natural assisted regeneration and plantings as per management actions 1, 3, 4 & 5 outlined in **Table 46** will improve stem densities of GHFF foraging trees within AU2 to greater than 315 per ha by Year 10 and 533 by Year 15.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Stem density within AU2 is to achieve at 315 per ha by Year 10 and 533 by Year 15. If the stem density is not progressing towards this by Year 5 then remedial actions will be applied. These include remedial plantings of advanced stock.
Species Stocking Rate Score				**4**	**4**	**4**	**6**	**8**			
MAX Species Stocking Rate Score				**10**	**10**	**10**	**10**	**10**			
Species Stocking Rate Score - out of 3				**1.2**	**1.2**	**1.2**	**1.8**	**2.4**			
Total				**4.62**	**4.62**	**5.42**	**7.22**	**7.82**			

Table 52: Grey-headed Flying-fox environmental outcomes – AU3

Assessment Unit - Regional Ecosystem	**AU 3 - Non-remnant (pre-clear RE 12.8.17)**											
Site Reference	Transect 1 Raw Data	Transect 3 Raw Data	Max Score	Average Score	AU Score	Year 5 Score	Year 10 Score	Year 15 Score	Year 20 Score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	5	5	**20**	**5**	**5**	**5**	**5**	**10**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** the assessment unit 'Vegetation Condition' will attain Regrowth status as defined under the Vegetation Management Act within 15 years.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	AU3 is to reach remnant status in 15 years, which requires 70% of benchmark height and 50% of benchmark cover to be reached. If the vegetation is not progressing toward regrowth status at Year 10, then remedial actions will be applied. These include remedial plantings of advanced stock.
Species Richness	0	0	**20**	**0**	**0**	**0**	**5**	**10**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** AU3 'Species Richness' will be improved to at least four foraging species by Year 10 and greater than six by Year 15.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species richness within AU3 is to be improved to at least one foraging species by year 10 and four foraging species by Year 15 and greater than six foraging species by Year 20. If the species diversity is not progressing towards this by Year 10, then remedial actions will be applied. These include remedial plantings of advanced stock.
Flower Score	0.0	0.0	**10**	**0.0**	**2**	**2**	**5**	**8**	**8**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** 'Flower Score' will improve to eight by Year 10 and ten by Year 20.	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 expected that 'Flower Score' will improve to eight by Year 10. If the 'Flower Score' is not progressing towards this requirement at Year 5, then remedial actions will be applied, including remedial plantings of advanced stock.
Timing of Biological Shortages	0	0	**10**	**0**	**0**	**0**	**7.25**	**10**	**10**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 46** AU3 'Timing of Biological shortages' will improve to cover all shortages based on flora species presence by Year 15.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Timing of biological shortages within the assessment unit is to cover all shortages by Year 15. If the species diversity does not approach this requirement at Year 15, then remedial actions will be applied. These include remedial plantings of advanced stock.
Quality of Foraging Habitat	0	0	**20**	**0**	**0**	**0**	**5**	**10**	**20**	It is expected that management actions 1, 3, 4 & 5 outlined in **Table 46** will result in an improvement to at least three significant food tree species being established by Year 15, and greater than six by Year 20.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat within AU3 is to achieve at least one species by Year 10, and greater than six by Year 20. If the species present do not reflect this requirement at Year 10, then remedial actions will be applied including plantings of advanced stock.
Non-native Plant Cover	90%	10%	**20**	**50%**	**5**	**10**	**20**	**20**	**20**	Non-native Plant Cover is low-moderate within AU3. Weed management actions 3 & 5 outlined in **Table 46** will improve this to below 5% within 10 years.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If improvement to 5% has not been achieved at Year 10 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score					**12**	**37.25**	**47.25**	**78**	**98**			
MAX Site Condition Score					***100***	***100***	***100***	***100***	***100***			
Site Condition Score - out of 4					**0.48**	**1.49**	**1.89**	**3.12**	**3.92**			
Size of patch	Patch size is greater than 500 ha	Patch size is greater than 500 ha	**10**	**10**	**10**	**10**	**10**	**10**	**10**	NA	NA	NA

Assessment Unit - Regional Ecosystem	**AU 3 - Non-remnant (pre-clear RE 12.8.17)**											
Connectedness	1 active camp within 20 kilometres (km)	1 active camp within 20 km	**10**	**3**	**3**	**3**	**3**	**3**	**3**	NA	NA	NA
Context	31-75%	31-75%	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Ecological Corridors	Not within ecological corridor	Not within ecological corridor	**10**	**0**	**0**	**0**	**0**	**0**	**0**	NA	NA	NA
Role of site location to species overall population in the state	1 active Level 3 roost within 20 km	1 active Level 3 roost within 20 km	**10**	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Threats to the species	Moderate (barbed wire fencing)	Moderate (barbed wire fencing)	**10**	**5**	**5**	**5**	**5**	**5**	**5**	The proposed offset site is currently fenced with barbed wire, a recognised threat to Flying-foxes. Management action 6 outlined in **Table 46** will retrofit barbed wire.	Baseline attributes have been established. This criterium is reliant upon the management of barbed wire fencing.	The removal of barbed wire will provide a reduction in threats however for the purposes of scoring outcomes. The threat score is maintained at 5.
Site Context Score					**30**	**30**	**30**	**30**	**30**			
MAX Site Context Score					**60**	**60**	**60**	**60**	**60**			
Site Context Score - out of 3					**1.50**	**1.50**	**1.50**	**1.50**	**1.50**			
GHFF Foraging Tree Density / ha	0	0	**10**	**0**	**2**	**2**	**4**	**6**	**6**	Natural assisted regeneration and plantings as per management actions 1, 3, 4 & 5 outlined in **Table 46** will improve stem densities of GHFF foraging trees within AU3 to greater than 74 per ha by Year 10, greater than 315 by Year 15, and greater than 533 by Year 20.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Stem density within AU3 is to be greater than 74 per ha by Year 10, greater than 315 by Year 15. If the stem density is not progressing towards this by Year 15 then remedial actions will be applied. These include remedial plantings of advanced stock.
Species Stocking Rate Score					**2**	**2**	**4**	**6**	**6**			
MAX Species Stocking Rate Score					**10**	**10**	**10**	**10**	**10**			
Species Stocking Rate Score - out of 3					**0.6**	**0.6**	**1.2**	**1.8**	**1.8**			
Total					**2.58**	**3.59**	**4.59**	**6.42**	**7.22**			

8. 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 Grey-headed Flying-fox and enhance the quality of the habitat within the MVOA.

8.1. Management Approach

The measures outlined in the following subsections are considered effective for the listed status of the Koala and GHFF 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).
- National Recovery Plan for the Koala *Phascolarctos cinereus*.
- National Recovery Plan for the Grey-headed Flying-Fox (*Pteropus policephalus*).

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 the environment which will benefit a wide range of native species present within the MVOA.

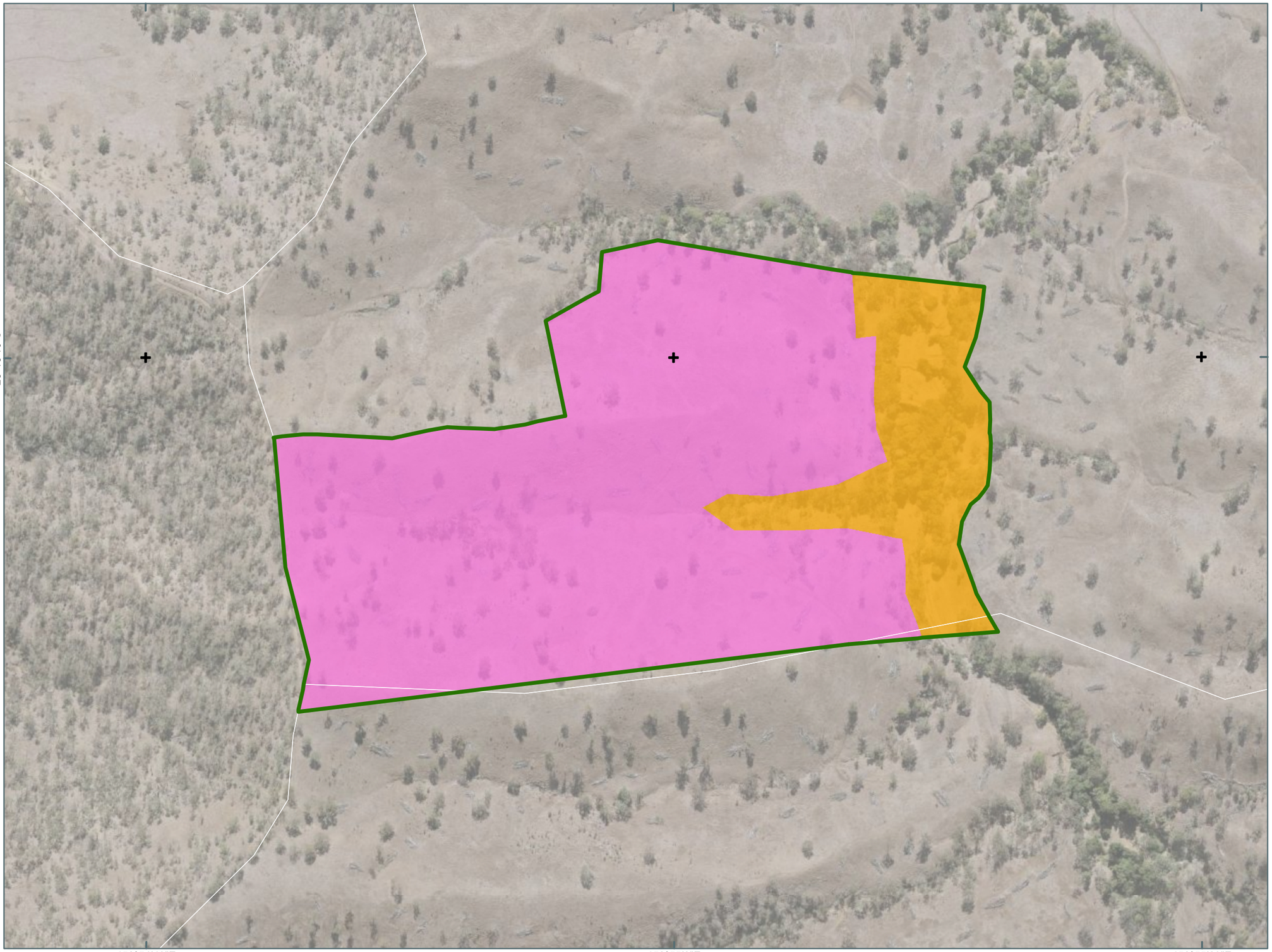
8.2. Operational Management Units

For the purpose of the management framework, Operational Management Units (OMUs) have been included to better target management actions necessary for the differing values present within each Assessment Unit. The OMUs detail the different actions required to achieve the environmental outcomes. The MVOA has been delineated into two OMUs representing areas of the MVOA that contain some existing vegetation (AU1 and AU2) and cleared area (AU3). Areas containing vegetation (OMU1) will be managed via natural regeneration techniques with infill planting where required whilst cleared areas (OMU2) will be managed via reconstruction and large-scale plantings. It is noted that AU1 and AU2 contain different regional ecosystems these ecosystems are dominated by the same species and differ based on Land Zone however the proposed management actions remain the same. Details of these OMUs are presented in **Table 53** and shown on **Plan 12**.

Table 53: Mount View Offset Area – Operational Management Units

OMU	Area (ha)	Assessment Units	VMA Status	Regional Ecosystems
1	7.5	AU1 & AU2	Category C (high-value regrowth)	12.3.3 and 12.8.17
2	17.5	AU3	Category X (non-remnant)	Pre-clear 12.8.17/12.8.16/12.8.14

12. OFFSET AREA OPERATIONAL MANAGEMENT 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.

Layer Sources

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Updated data available at

LEGEND

- Qld DCDB
- Offset area

Operational Management Units

- Operational Management Unit 1 [4.4 ha]
- Operational Management Unit 2 [20.6 ha]



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@ A3

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16/12/2025

11826 E 15 Offset Area OMUs A

8.3. Management Action 1 – Legally Secure MVOA

The MVOA must be protected and managed against known and potential threats for the Koala and GHFF in perpetuity to attain a conservation gain. The MVOA will be legally secured prior to commencement of the action via a Voluntary Declaration (VDec) administered under the VMA. Notification of declaration will be supplied to DCCEEW.

A covenant under either Chapter 6 Part 4 Division 8A of the *Land Act 1994* (Qld) or Part 6 Division 4A of the *Land Titles Act 1994* (Qld) will be registered within 12 months of commencing the action. If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW.

The declared area will be recognised as making significant contribution to the conservation of biodiversity. The Offset Provider will continue to manage the MVOA for the life of the offset whilst reporting required milestones and data to the proponent annually. Legally securing the MVOA 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 ACRs.

8.3.1 Management Action Completion Criteria

Timing	Completion Criteria
Prior to commencing the Action	Legally secure the MVOA via a Voluntary Declaration (VDec) administered under the VMA and notify DCCEEW.
Year 1	Register a covenant under the Land Act 1994 (Qld) and notify DCCEEW within 20 business days. If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW.

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

8.4.1 Justification

Wild Dogs are 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.

Predation rates by Wild Dogs are difficult to quantify because attacks often occur in locations infrequently visited by people and the carcasses of the 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 Scenic Rim Regional Council, with the local council website documenting that the impact of wild dog activity has increased in the past 10 years due mainly to the increasing population in the region.

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 but not confirmed for another 38 (13.1% of the total) deaths. 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).

It is also acknowledged that although they are not listed as a direct threatening process to the target MNES species, feral pigs are opportunistic omnivores and widely known to cause significant environmental destruction to soil and vegetation via consumption, digging, and spreading weeds, particularly surrounding waterbodies. Therefore, feral pigs cause destruction of habitat value and water resources which has the potential to indirectly impact essential habitat areas for Koala. This is similarly the case for and European Rabbit (*Oryctilagus cuniculus*) which impact native vegetation. Feral deer alongside other non-native predators such as *Felis catus* (feral cat) and *Vulpes vulpes* (European red fox), also have the potential to attack and stress Koalas making them more susceptible to disease.

Wild Dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are considered direct threats to the MNES target species and therefore their control is considered a high priority. Medium priority threats to Koala and Grey-headed Flying Fox include Feral Cat (Felix catus) and *European Red Fox* (Vulpes vulpes). These species are not listed as a key threatening process to either of the MNES species however both are known to be opportunistic predators with significant impacts to native species. Although they are not listed as a direct threatening process to the target MNES species for the Project, Feral Pig (*Sus scrofa*) and European Rabbit (*Oryctilagus cuniculus*) are widely known to cause significant environmental destruction to soil and vegetation via digging, spreading weeds, particularly surrounding waterbodies, and therefore are considered low priority threats to Koala and GHFF directly however moderate threats to the ecosystems they rely on.

Threats identified at the MVOA are described in **Section 5.4**. Key species assessed as a priority to for management, and their associated risks, are summarised in **Table 54**.

Table 54: Feral animal species management priorities

Priority (category)	Scientific name (Common name)	Queensland *Biosecurity Act 2014* status	Risks (potential and actual)	Distribution and prevalence	Objective
1 (high)	Wild Dog (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*)	Class 3, 4, 5 and 6	Actual impacts on agricultural production values – HIGH Actual impacts on native fauna – HIGH	Widespread occurrence in low to medium densities	Control
2 (medium)	Feral Cat (*Felis catus*)	Class 3, 4 and 6	Actual impacts on native fauna – HIGH	Widespread occurrence in low to medium densities	Control
3 (medium)	European Red Fox (*Vulpes vulpes*)	Class 3, 4, 5 and 6	Actual impacts on native fauna – MEDIUM	Widespread occurrence in low to medium densities	Control
4 (low)	Feral Pig (*Sus scrofa*) European Hare (*Oryctolagus cuniculus*)	Class 3, 4 and 6 Class 3, 4, 5 and 6	Actual impacts on native fauna – LOW Actual impacts on ecosystems native fauna rely on – MEDIUM	Widespread occurrence in low to medium densities	Control

8.4.2 Baseline Survey Results

Wild Dog presence within the MVOA was targeted using baited motion-triggered camera traps. Camera trap design, set up, and deployment was conducted as per the Queensland Government *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (June 2022), and is detailed within **Section 6.1**.

Three (3) baited camera traps were installed across the MVOA for a period of 18 nights from 15 September to 3 October 2025. Baseline motion-triggered camera trapping did not detect the presence of non-native vertebrate pests such as Wild Dogs within the MVOA. However, fauna cameras located within the wider offset property have recorded the presence of Wild Dog. Further, contemporary confirmed records of such species are present on the Queensland WildNet database within 20 km of the site, (2) Wild Dog (*Canis familiaris*), five (5) Red Fox (*Vulpes vulpes*), one (1) Feral Cat (*Felix catis*), and one (1) European Brown Hare (*Lepus europaeus*). Wild Dogs in particular have large home ranges and frequent daily movements. The on-going monitoring of feral animals will continue to observe for changes in abundance and species within the MVOA. Detailed baseline survey results are detailed in **Section 6.2.2**.

8.4.3 Management Action 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 for the control of the pest species until completion criteria have been achieved. Invasive species control methods to be implemented across the MVOA will include at a minimum:

- 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.
- 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.
- 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 MVOA, being Scenic Rim Regional Council.
- Signage installation informing that feral animal control being undertaken within the MVOA.
- Annual review of the feral animal management plan by a suitably qualified expert to ensure it utilises the most appropriate and best practice techniques for the MVOA.

A range of control methods will be implemented at the discretion of the suitably qualified pest contractor for predator species are listed in **Table 55** and **Table 56**. 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 MVOA 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 MVOA.

The following tasks will require specific expertise or appointed contractors to complete:

- Baseline and repeat surveys to be completed by a senior tertiary trained Ecologist, Zoologist or Environmental Scientist with a minimum of five years industry field experience;
- Use of 1080 or sodium fluoroacetate poisons is regulated under the Health (Drugs and Poisons) Regulations 1996. Deployment and use of this control method to be via a registered contractor holding relevant permits and demonstrated experience;
- Hunting / shooting program to occur in accordance with all relevant Queensland Government permits and regulations.

Table 55: Offset property recommended control methods for identified pest species

Scientific Name	Common Name	Baiting	Fencing	Shooting	Trapping
Canis familiaris	Wild Dog	Y	Y	Y	Y
Felis catus	Feral Cat	Y	Y	Y	Y
Vulpes vulpes	Red Fox	Y	Y	Y	Y
Sus scrofa	Feral Pig	Y	Y	Y	Y
Bos taurus	Domestic Cow	N	Y	N	N

** Y indicates appropriate management action; N indicates inappropriate management action*

Table 56: Predator species control methods - adapted from *WoolProducers Australia 2014*

Method	Efficacy	Cost effectiveness	Target specificity	Humaneness acceptability	Comment
Ground baiting with 1080	Effective for Wild Dogs, Feral Pigs, European Hare and European Red Fox	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 feral pest species	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 / European Red Fox / Deer / Feral Pig – 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, particularly where revegetation is occurring to protect from Feral Pig, Deer and European Hare.	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	Suggested aversion methods include flashing lights, sounding alarms, objects flapping in the wind and chemicals.



8.4.4 Management Action Responsibility

The offset provider is responsible for establishing, funding, and resourcing the pest management activities. To ensure effective implementation, the following are required:

1. All contractors for all pest control measures will be suitably qualified.
2. Pest control contractors will be responsible for the upkeep of appropriate training for all pest control staff.
3. Pest control contractors will be responsible for the data collection and upkeep of all pest control and monitoring data and provide the data to the proponent when available and required for reporting annually and in 5-yearly summaries of previous outcomes.
4. Lethal controls will consist of best practice management measures as outlined.

8.4.5 Management Action Completion Criteria

Timing	Completion Criteria
Year 1	Develop Pest Management Plan with a focus on wild dog management.
Year 2 – 20	Implement the Pest Management Program to ensure: • Suppression of feral animal species (predators and herbivores) and their impacts within the offset area particularly wild dogs. • Minimise MNES injury and mortality to the greatest extent possible within the offset area for the life of the offset. • Minimise potential damage to rehabilitation plantings and areas to receive plantings through management of feral pigs and other non-native herbivore species – timing to be in conjunction with rehabilitation.
Years 5, 10, 15	Complete review of PMP based on available data and endorsed guidelines and including a review of management techniques and adaptive management strategies where appropriate.

<u>Koala Mortality Rate and Caveats</u>

With relevance to the completion criteria, assessment of Koala injury or death attributable to feral animals needs to be assessed. Koala mortality is typically recorded through passive means including incidental observation of deceased Koalas determined from physical observation of the kill site and the deceased individual (Hanger et al. 2017). In some studies of Koala mortality researchers are interested in discerning between predator species and domestic and wild animals in peri-urban environments and in these studies utilise genetic analysis of the deceased individual to confirm the identity of the predator (Gentle et al. 2019, Hanger et al. 2017). However, it is considered that for the purposes of implementing this OMP, which is primarily concerned with documenting the extent to which predators are generally responsible for Koala mortality, the cause of mortality (i.e., predation or other) can be understood through physical observation of the deceased Koala at the kill site. Due to the context of the site, it is most likely that the cause of Koala mortality would be due to predators rather than urban mortality drivers such as vehicle strike.

Incidental observation is used as the primary means for detection of Koala mortality and will be integrated into the broader baseline survey effort of the offset site including during non-fauna targeted assessments such as surveys for vegetation Site Condition and weed mapping.

8.4.6 Management Action Monitoring

The effectiveness of pest management actions will be measured and monitored through a structured process:

1. Annual scheduled pest surveys and control (Years 2–20) reported.
2. Progressive reporting will consist of annual reports and also 5-yearly summaries of previous pest management outcomes.
3. Annual Compliance Reports – Each survey's findings and pest management outcomes etc. will be included in the annual and 5-yearly reporting to be adopted into Annual Compliance Reports.

A suitably qualified ecologist will complete monitoring for non-native vertebrate pests before the end of Years 5, 10, 15 and 20 of the offset with the aim of demonstrating:

- Relative abundance of non-native vertebrate pests on-site with reference to baseline data;
- Feral animal scat / track or imprint evidence at targeted survey locations;
- Site population census on infrared drone and baited remote sensor camera surveys;
- Occurrence of injury or mortality on MNES attributed to vertebrate pest species.

The following non-native predator monitoring methodology will be implemented by a suitably qualified person using the baseline survey methodology outlined in **Section 6.1.4**:

<u>Desktop Assessment</u>

- Review previous survey mapping and camera locations, field datasheets, photos and notes.

<u>Field Survey</u>

- Motion detection camera deployment for minimum of 14 nights in the same locations during each milestone monitoring event. Additional cameras will be utilised where required as rehabilitation works occur in the east of the MVOA. GPS coordinates and photos to be recorded. New camera monitoring locations will be established during Year 1 of the offset within the offset area to enable the collection of offset area-specific data to be repeated for the life of the offset.
- 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.

Action Timing

- Year 1 – Develop Pest Management Plan
- Years 1 -5 – Commence Pest Management Activities as per Pest Management Plan and carry out annual monitoring.
- Year 5 – Review monitoring results and compare with baseline to demonstrate the completion criteria has been met (reduced risk of injury or death of Koala from non-native predator attacks and no evidence of non-native vertebrate pests recorded within the MVOA as a result of property wide pest management). Adaptive management to occur where necessary (i.e. pests recorded within MVOA).
- Year 6 – 10 – Continue Pest Management Activities and carry out annual monitoring.
- Year 10 – Review monitoring results and compare with baseline to demonstrate the completion criteria has been met (reduced risk of injury or death of Koala from non-native predator attacks and no evidence of non-native vertebrate pests recorded within the MVOA as a result of property wide pest management). Adaptive management to occur where necessary (i.e. pests recorded within MVOA).
- Year 11 – 15 – Continue Pest Management Activities and carry out annual monitoring.
- Year 15 – Review monitoring results and compare with baseline to demonstrate the completion criteria has been met (reduced risk of injury or death of Koala from non-native predator attacks and no evidence of non-native vertebrate pests recorded within the MVOA as a result of property wide pest management). Adaptive management to occur where necessary (i.e. pests recorded within MVOA).
- Year 15 – 20 – Continue Pest Management Activities and carry out annual monitoring.
- Year 20 – Review monitoring results and compare with baseline to demonstrate the completion criteria has been met (reduced risk of injury or death of Koala from non-native predator attacks and no evidence of non-native vertebrate pests recorded within the MVOA as a result of property wide pest management). Adaptive management to occur where necessary (i.e. pests recorded within MVOA).

8.4.7 Management Action Reporting

Monitoring survey results will be reported by the suitably qualified person in the 5-, 10-, 15-, and 20-Year 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.

Implementation of the PMP and results of pest management program including 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 offset area, will be detailed annually by the Offset Provider in OAARs. OAARs and/or Milestone Reports will be included in the relevant Annual Compliance Report.

8.4.8 Adaptive Management for Non-native Predator Species

Without intervention and active management, the risk of feral animal impacts on MNES and their habitat are assessed as 'high'. This is based on regional and local government data on feral animals combined with evidence of livestock predation recorded on-site and an abundance of research in the surrounding area indicating the prevalence of feral dogs, European fox and feral cats. The pest management strategies incorporate intensive implementation methods and three major data collection survey events for confirming base case and successful reduction of pest management impacts.

The pest management program will use a combination of pest management monitoring data collected from pest management contractors and monitoring data collected through annual or 5-yearly surveys to inform site management. Major survey and review periods for the OMP are set at Years 5, 10 and 15 to ensure the program achieves long-term reduction and does not respond to specific stochastic events such a contextual fluctuation in pest populations such as wild dogs.

Triggers for adaptive management include:

- Following positive records from pest monitoring, implemented control efforts do not yield expected pest animal kills.
- Feral animals are recorded during scheduled monitoring post-control efforts.
- Opportunistic observations of feral animal activity, including sightings of animals, their tracks or scats during general offset site management works.
- Confirmed or potential damage to rehabilitation plantings or areas prepared to receive plantings such as that caused by non-native herbivores (pigs, deer).

Adaptive management measures include:

- Spatially and temporally expanding monitoring efforts (*i.e.,* more sites, more often in more locations) to ensure greater site coverage.
- Increasing frequency of monitoring and control events relevant to target species beyond existing events outlined earlier.
- Sporadic controls triggered by ad hoc pest animal sightings or evidence of potential impact, including pest species additional to those detected and identified as target species for pest management upon completion of baseline pest surveys.
- Working more closely with adjoining land holders on landscape scale controls.
- Applying multiple control measures in unison to improve control efficacy.

If monitoring data indicate that the PMP is not meeting its timing, responsibility, monitoring and control targets, the program will be adjusted using the following strategies:

- Spatially and temporally expanding monitoring efforts (*i.e.,* more sites, more often in more locations) to ensure greater site coverage.
- Increasing frequency of monitoring and control events beyond those outlined above.
- Sporadic controls triggered by ad hoc pest animal sightings, including pest species additional to those detected and identified as target species for pest management upon completion of baseline pest surveys.
- Working more closely with adjoining land holders on landscape scale controls.
- Applying multiple control measures in unison to improve control efficacy.
- Review responsibility where lapsed and advise alternative roles and / or personnel.

This adaptive management approach ensures regulatory compliance, continuous improvement, long-term effectiveness, and alignment with broader conservation and threat abatement goals.

8.5. Management Action 3 – Management of Weeds of National Significance

8.5.1 Justification

Weed control is fundamental to improving biodiversity and the ecological condition of habitat within the MVOA. Historical land uses across the MVOA have resulted in the introduction, spread, and persistence of a variety of environmental weeds. Whilst there have been a variety of environmental weeds recorded across the MVOA, the key species to be controlled in the MVOA is *Lantana camara* (Lantana), which is a listed WONS and key threat to Koala habitat and movement. The estimated cover of Lantana varies throughout the MVOA from 0-25% across the majority of the area and 25-50% coverage in adjoining gully line vegetation. Furthermore, without suppression, Lantana has the potential to rapidly spread and colonise, particularly where neighbouring infestations are present. Continued management is therefore necessary to prevent infestations from returning after initial treatment.

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, as it limits Koalas movement, resulting in prolonged time spent on the ground and therefore increasing susceptibility to predators (Paull et al. 2019, The Honourable Leeanne Enoch 2019). The Queensland Koala Strategy 2020-2025 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 supresses 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.

In addition to *L.* camara, *Senecio madagascariensis* (Fireweed) is a prominent weed throughout native and improved pastural land, open woodland and grassland that is abundant and conspicuous throughout much of southern Queensland. This species is also listed as a WONS due to its invasiveness, capacity to rapidly spread, and environmental impacts. Although not listed as a direct threat or key threatening process to MNES, Fireweed is known to outcompete native species and reduce ground cover, ultimately resulting in erosion and stripping of topsoil. As such, Fireweed should be controlled to limit competition with natural regeneration of Koala and GHFF foraging trees and improve overall soil health. Field surveys identified significant infestations of Fireweed throughout the MVOA, particularly within the paddock space, as is typical of pastural land.

It is not possible to remove *L. camara* or *S. madagascariensis* from the MVOA on a single occasion, as persistent seed banks of the species remain viable for long periods of time. Germination can occur rapidly after parent plants have been removed due to increases in light and resource availability (i.e., availability of soil nutrients,



moisture content and space). Therefore, repeat visits to the MVOA following the initial treatment for follow-up weed control, is critical to prevent seed set and dispersal.

8.5.2 Management Action Measures

Weed management will be implemented as follows

- Complete baseline monitoring in accordance with the method outlined in **Section 6.1.5**.
- Carry out weed treatment and removal in accordance with the Rehabilitation Management Plan (RMP - refer **Appendix F**).
- In accordance with the RMP, manage weeds of national significance (WONS), SRRC declared weeds and other weeds such which may have an impact on habitat regeneration is to occur in the offset area, with a particular focus on suppression of the spread of Lantana camara.
- Prevent the further spread or establishing of new Lantana camara outbreaks within the offset area by excluding cattle and controlling pest species from the offset management zone.
- Vehicles, machinery and equipment is to be cleaned prior to entering the offset area to remove seeds and sediment to prevent the introduction of new weed species into the offset area.

Weed removal will prioritise WONS, specifically *L. camara*, which is known to impact Koala mobility, with supplementary weed management completed on a priority system. Fireweed will be controlled as a secondary priority species due to its categorisation as a WONS and impacts to soil health. Weed management strategies are listed in **Table 57** for *L.camara*, **Table 58** for *S. madagascariensis*, and **Table 59** for other WONS.

Table 57: Lantana management strategies

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 58: Fireweed Management Strategies

	Herbicide Application	Cutting / Slashing	Hand Removal	Soil Cultivation	Surveillance	Property Biosecurity
Advantages	Can enable targeted control of fireweed Quick to apply to multiple plants Range of herbicides to suit different situations	Can control fireweed if done frequently Can stimulate vigorous pasture grass regrowth, depending on species and timing Applicable to domestic and amenity situations (e.g. mown lawns)	Low cost Suitable for early intervention where there are small infestations Minimal environmental impact. Good for 'mopping-up' after other controls	Non-chemical means of controlling fireweed seedlings Suitable for gardens and pasture establishment	Early detection and intervention reduce impacts and costs	Prevents weed entry and spread Avoids future costs and impacts Low ongoing cost
Disadvantages	Long withholding periods for some herbicides Risk of off-target effects on desirable plants Risk of spray drift and environmental contamination	Cut fireweed can regrow, requiring further treatment Risk of spreading seed Cut fireweed remains toxic and stock cannot avoid eating it in clippings	Need to locate all individual plants before seed set Time-consuming and labour intensive Generally not practical for large infestations and properties	Promotes fireweed germination, requiring further control Risk of soil erosion and damage to soil structure Risk of fireweed regrowth in moist soils Cost of machinery	Searching is time consuming and ongoing (every 2–4 weeks)	Setup costs for washdown areas Ongoing time commitment to manage spread pathways Ongoing effort needed to obtain everyone's compliance
Timing	Most effective boom sprayed on seedlings in autumn–winter Spot spraying at other times of year	Winter–spring for cool season pasture grasses, mid-spring for warm season grasses Avoid seeding fireweed Avoid cutting in late spring to reduce risk of over-summering of fireweed Multiple passes needed	Year-round	Autumn–winter for fireweed seedlings	Autumn–spring May be occasional plants in summer in wetter areas	Year-round
Integration with other control measures	Biosecurity Competitive pasture Soil cultivation Hand removal	Biosecurity Competitive pasture Sheep/goat grazing Herbicides	Biosecurity Surveillance Competitive pasture Herbicides	Biosecurity Surveillance Competitive pasture Herbicides	All other fireweed control measures	All on-property activities All other fireweed control measures

Cautions

Various legal requirements apply when using herbicides Follow safety directions Follow directions on managing drift and residue risks	Machinery hygiene required to minimise risk of spreading weed seeds Cannot use pastures containing fireweed for hay or silage Cannot graze until cut fireweed is decomposed	Wear gloves Take precautions to avoid strain injuries	Frequent cultivations can damage soils and expose them to erosion	Difficult to detect fireweed until it is flowering, by which time it may have set seed	Difficult to limit natural pathways of spread – particularly wind

Note: table extracted from Department of Agriculture, Fisheries and Forestry, Weeds of National Significance Fireweed National best practice management manual for fireweed (*Senecio madagascariensis*), Australian Government. Several potential prevention and control measures were excluded from this table due to not being applicable to large properties or for offset property purposes (i.e. Mulching, Sheep/Goat Grazing, Competitive Pasture)

Table 59: Other WONs Treatment and Removal Methods

No.	Family	Scientific name	Common name	Non-chemical control	Chemical control
1	Amaranthaceae	*Alternanthera philoxeroides*	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 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
2	Gramineae	*Andropogon gayanus*	Gamba Grass		
3	Annonaceae	*Annona glabra*	Pond Apple		
4	Basellaceae	*Anredera cordifolia*	Madeira Vine		
5	Asparagaceae	*Asparagus aethiopicus cv. Sprengeri*	Asparagus Ground Fern		
6	Asparagaceae	*Asparagus africanus*	Asparagus Fern		
7	Asparagaceae	*Asparagus asparagoides*	Bridal Creeper		
8	Asparagaceae	*Asparagus declinatus*	Bridal Veil		
9	Asparagaceae	*Asparagus plumosus*	Asparagus Fern		
10	Asparagaceae	*Asparagus scandens*	Climbing Asparagus Fern		
11	Cactaceae	*Austrocylindropuntia spp.*	Prickly Pears		
12	Cabombaceae	*Cabomba caroliniana*	Cabomba		
13	Asteraceae	*Chrysanthemoides monilifera subsp. Monilifera*	Boneseed		
14	Asteraceae	*Chrysanthemoides monilifera subsp. rotundata*	Bitou Bush		
15	Asclepiadaceae	*Cryptostegia grandiflora*	Rubber Vine		
16	Cactaceae	*Cylindropuntia spp.*	Prickly Pears		
17	Fabaceae	*Cytisus scoparius*	Common Broom		
18	Bignoniaceae	*Dolichandra (Macfadyena) unguis-cati*	Cat's Claw Creeper		
19	Pontederiaceae	*Eichhornia crassipes*	Water Hyacinth		
20	Fabaceae	*Genista linifolia*	Flax-leaved Broom,		
21	Fabaceae	*Genista monspessulana*	Montpellier Broom		
22	Poaceae	*Hymenachne amplexicaulis*	Hymenachne		
23	Euphorbiaceae	*Jatropha gossypifolia*	Bellyache Bush		
24	Verbenaceae	*Lantana camara var. camara*	Lantana		

No.	Family	Scientific name	Common name	Non-chemical control	Chemical control
25	Solanaceae	*Lycium ferocissimum*	African Boxthorn		
26	Mimosaceae	*Mimosa pigra*	Giant Mimosa		
27	Gramineae	*Nassella neesiana*	Chilean Needle Grass		
28	Gramineae	*Nassella trichotoma*	Serrated Tussock		
29	Cactaceae	*Opuntia spp.*	Prickly Pears		
30	Cactaceae	*Parkinsonia aculeata*	Parkinsonia		
31	Asteraceae	*Parthenium hysterophorus*	Parthenium Weed		
32	Mimosaceae	*Prosopis pallida*	Algaroba		
33	Rosaceae	*Rubus fruticosus aggregate*	Blackberry		
34	Alismataceae	*Sagittaria platyphylla*	Delta Arrowhead		
35	Salicaceae	*Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii*	Willows (except Weeping Willow, Pussy Willow, and Sterile Pussy Willow)		
36	Salviniaceae	*Salvinia molesta*	Salvinia		
37	Asteraceae	*Senecio madagascariensis*	Fireweed		
38	Solanaceae	*Solanum elaeagnifolium*	Silver Nightshade		
39	Tamaricaceae	*Tamarix aphylla*	Athel Pine		
40	Fabaceae	*Ulex europaeus*	Gorse, Furze		

8.5.3 Management Action Responsibility

The Offset Provider will be responsible for establishing, resourcing and funding all weed management actions detailed in the OMP and RMP including management and monitoring actions.

8.5.4 Management Action Completion Criteria

Timing	Completion Criteria
Year 1	Complete baseline monitoring in accordance with the method outlined in Section 6.1.5 Implement the RMP and ensure WONS are treated within 12-months of the commencement of the offset
Year 10	Reduce WONS to <5% by the end of Year 10
Year 10 – 20	Maintain WONS cover at <5% for the life of the offset

8.5.5 Management Action Monitoring

A number of monitoring actions relating to the presence of WONS and other weeds are proposed as part of the implementation of the OMP and RMP. A rehabilitation monitoring program including photo monitoring is detailed in the RMP which proposes a monitoring frequency of bi-annually in Years 1-5 and five-yearly at Years 10, 15 and 20. Baseline monitoring will be completed prior to the commencement of weed treatment works occurring. Refer to Appendix C for further details regarding the weed monitoring methodology. This is proposed as additional to the MHQA surveys.

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 see **Table 47** to **Table 52**). Surveys will include a repeat of baseline survey methodologies MHQA transects which both provides measures of weed coverage. The following procedures will be implemented to ensure that the monitoring events align with the baseline survey methodology:

<u>Desktop Assessment</u>

- Reviewing previous survey mapping, field datasheets, photos and notes including WONS priority areas.
- Reviewing weed and bush regeneration records for the last year.

<u>Field Survey</u>

- MHQA transects are carried out at baseline survey locations.
- Utilising the weed cover assessment methodology discussed in **Section 6.1.5**, inspect previously identified WONS infestations. Mapping of WONS infestation areas using GPS unit and quantify using

weed cover transects and previous locations. Additional weed cover transects will be utilised if required depending on the weed cover assessment.

- Record non-native flora species.
- Provide photo monitoring at established locations to be set up in Year 1 of the offset with photo location and direction.
- Note positive and/or negative changes in weed density and coverage.

8.5.6 Management Action Reporting

Reporting of WONS management will include the following:

- The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports (OAARs) to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.
- Photo Monitoring Reports to be prepared at frequencies specified in the RMP by a suitably qualified person (refer Appendix C).
- Milestone weed and MHQA monitoring survey results will be reported by the suitably qualified person in the 5, 10, 15 and 20 Year Milestone Report. This will provide detail on survey methodologies and detected WONS and other weed presence with reference to the baseline survey data.
- Implementation of the weed management actions within the RMP will be detailed annually by the Offset Provider in OAARs.

8.5.7 Management Action Adaptive Management

The dominant WONS species present within the offset area is lantana with some occurrence of fireweed. A range of other exotic grass and herbaceous species are present, indicative of the high level of disturbance. In the event weed management targets are not met within the prescribed timeframes of the OMP and the RMP, adaptive management will be triggered which includes:

- Adopting different management techniques
- Increasing the use of successful techniques
- Increasing the intensity/frequency of management program
- Changing the timing or locality of proposed target treatment locations or events

8.6. Management Action 4 – Bushfire Management Plan

8.6.1 Justification

The MVOA and the broader property are mapped as containing medium to very high high-risk fuel loads for wildfire by the State Government (**Plan 13**). Fire management of the MVOA 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 MVOA 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 MVOA in the context of the surrounding landscape. The overall objective is to prevent fire-induced Koala mortality and impact to Koala and GHFF habitat 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 MVOA will ensure management objectives are achieved.

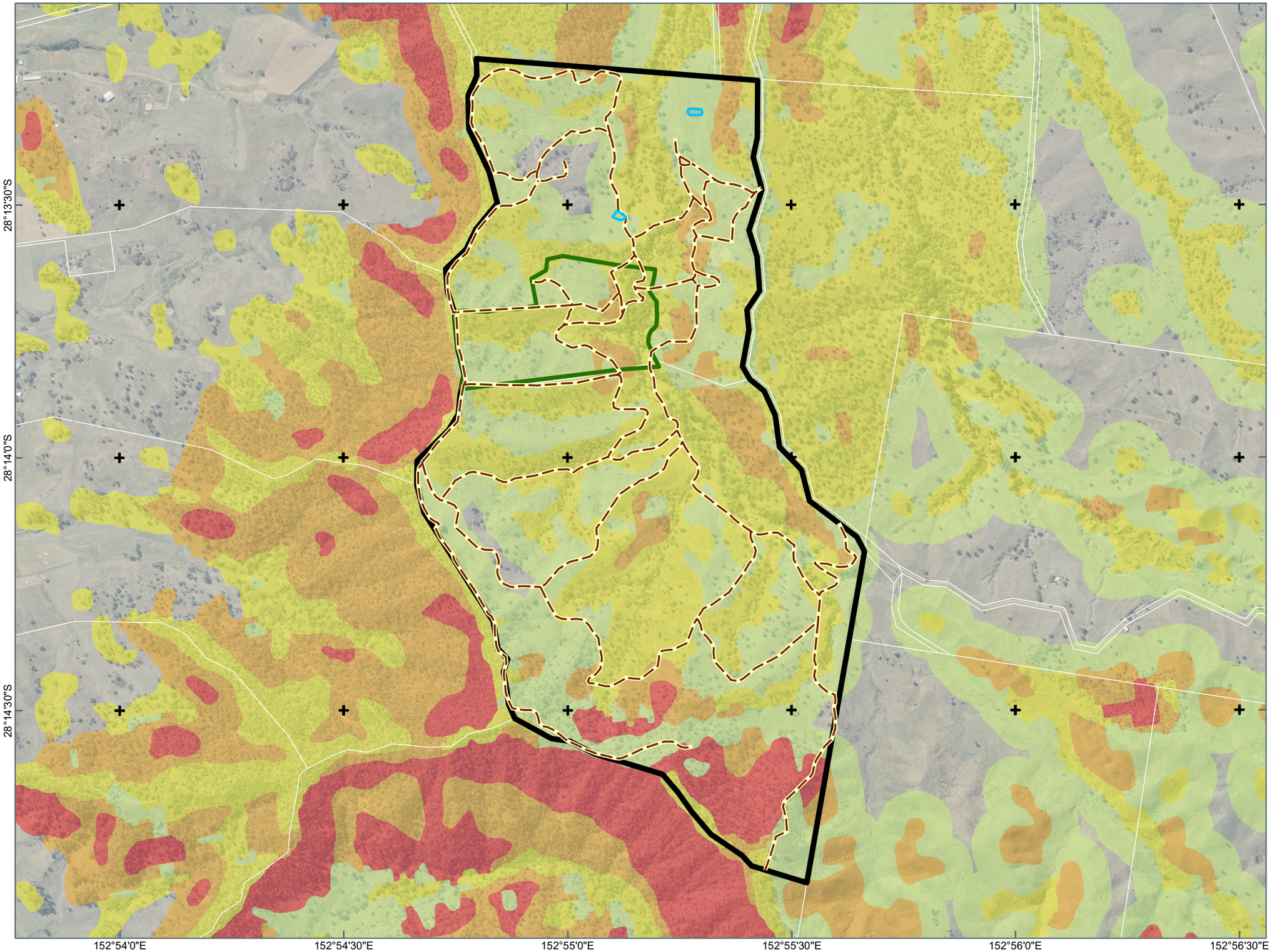
Under current Queensland legislation, landowners are required to prepare and plan for bushfire hazards by being aware of fire management issues in the area, trimming trees, mowing grass, removing flammable material around the home, and clearing vegetation, particularly if land boundaries are shared with 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 MVOA and broader offset property has internal tracks and access along existing fence lines that have the potential to act as fire trails. Specific actions as directed by the local authorities must be implemented including prescribed burning or other techniques undertaken in consultation with the Queensland Rural Fire Brigade to manage fuel loads if required.

8.6.2 Management Action Measures

A site-specific Bushfire Management Plan (BMP) will be developed in accordance with relevant Queensland guidelines and endorsed by an experienced bushfire practitioner to reduce potential threats from fires to Koala. The BMP will be completed for the MVOA within 1 year from the date of the approval. The BMP will assess baseline fuel loads and aim for no Koala mortalities to occur as a result of overall fuel hazard reduction action. The BMP will expand points on wider fire management concepts.

At present, the offset area contains internal tracks and access along existing fence lines that may act as fire breaks (Refer to **Plan 13**). This fire management system will be maintained as the offset property transitions from open pasture to MNES habitat restoration as specific offset activities are sequentially completed. Specific actions as directed by the local authorities must be implemented which may include burn plans, prescribed burning or other techniques undertaken in consultation with the Queensland Rural Fire Brigade to manage fuel loads.

13. OFFSET AREA BUSHFIRE MANAGEMENT



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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Updated data available at

LEGEND

- Qld DCDB
- Offset area
- Mount View offset property
- Existing fire management lines/fire breaks
- Existing Dams/Waterbodies

Scenic Rim Regional Council Bushfire Hazard

- Potential Impact Buffer
- Medium Potential Bushfire Intensity
- High Potential Bushfire Intensity
- Very High Potential Bushfire Intensity



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Fuel Load Reduction

Specific actions as directed by the local authorities must be implemented including burn plans, prescribed burning or other techniques undertaken in consultation with the Queensland Rural Fire Brigade to manage fuel loads.

Prescribed low intensity burning as a bushfire management technique is widely employed and generally agreed upon as an effective means of reducing widespread and severe bushfire risk particularly when implemented in line with Indigenous cultural burning practices. The National Recovery Plan for Koala acknowledges the scope of impacts of prescribed burning on Koala population dynamics is not well understood. While the risk of wildfire can be reduced through prescribed burning regimes, it is acknowledged that the effectiveness of this is determined by the scale and severity of the bushfire, as exemplified by the 2019-2020 summer bushfires which affected areas that were considered low risk to bushfire.

Instead of conducting a full ecological burn through a larger area of the offset, low intensity hazard reduction burns can be undertaken to reduce the locally abundant fire fuel loads and in turn reducing the risk of a high intensity wildfire spreading throughout the offset. A hazard reduction action will be used around fire exclusion zones (i.e., revegetation zones) to reduce the risk of any fire spread into these areas.

Where approved by DCCEEW, reduced load livestock grazing will be applied in selected mature tree areas and/or once revegetation and assisted regeneration areas to achieve specific metrics. Permanent high density / intensive grazing has potential to negatively affect vegetation composition so will not occur. For this reason, temporary low impact grazing for short periods would occur only as a bushfire fuel load management tool which remains available when controlled burns are not suitable. Under no circumstances will the MVOA be grazed outside of this management action.

New research is emerging which supports the benefits of low intensity temporary grazing for the management of bushfire fuel loads and the broader benefits in avoiding the impacts of wildfire on conservation values. At the time of drafting this OMP the Department does not support even the temporary use of light grazing as a preferred bushfire load management tool when compared to traditional controlled burns. While the Offset Provider is of the belief both are important to help manage fuel loads and can occur without impact on the creation and management of Koala habitat, no grazing will occur within the approved MVOA until subsequent Department approval for this use has been provided.

As part of providing further evidence on this management tool to the Department the following items will be considered and documented:

A. Contemporary research and published literature on the use of low intensity grazing in the management of bushfire fuel loads and promoting conservation outcomes;
B. Quantifiable triggers for when MVOAs will be suitable for low intensity grazing without impact to conservation values:
    - Fuel loads (dry matter/ha) triggers for livestock to be introduced and removed from the area;
    - 5 years after replanting and establishing;
    - Max number of animals per ha (Stocking rates / rotational grazing);

- Temporary or permanent fencing requirements;
- Timing and season for when grazing is likely to occur;
- Metrics for measuring before and after fuel loads, weed cover, native regeneration cover and diversity; and
- Monitoring, reporting and corrective metrics.

It is noted that the use of cattle grazing for bushfire reduction has been included as a potential management activity and to provide complete review of strategies. Cattle grazing is not proposed and will not occur within the MVOA unless approved by the department separately to this OMP.

8.6.3 Management Action Responsibility

The Offset Provider is responsible for:

- Liaising and coordinating with Queensland rural fire service (QRFS) and SRRC to develop BMP and implement bushfire management measures;
- Maintaining existing bushfire breaks; and
- Carrying out additional rehabilitation as required to account for losses from uncontrolled bushfire.

8.6.4 Completion Criteria

Timing	Completion Criteria
Year 1	• Develop BMP • Complete consultation with SRRC and QRFS • Maintain existing firebreaks within offset area
Year 2 – 20	• Implement BMP • Monitor and maintain fuel loads within the offset area • Maintain firebreaks

8.6.5 Management Action Monitoring

Monitoring of the MVOA will be undertaken by the Offset Provider annually and as required to review access tracks, fire breaks, fuel loads and outcomes of controlled burns or other management techniques such as use of livestock. Fuel loads and bushfire breaks will be monitored annually by the Offset Provider as required depending on seasonal variation in fuel loads.

8.6.6 Management Action Reporting

Implementation of the BMP will be reported annually by the Offset Provider in the MVOA Annual Report and will provide detail on maintenance and monitoring activities undertaken under the BMP such as maintenance of access tracks and fire breaks, records of seasonal fuel loads and outcomes of controlled burns or other management techniques such as use of livestock. Notes of any evidence of positive and/or negative changes will be recorded and documented. Annual monitoring and reporting is important to ensure any possible negative impacts are identified early and management processes are appropriately adapted to ensure conservation outcomes are achieved.

8.6.7 Management Action Adaptive Management

Management actions to reduce the risk of bushfire impacts within the offset area include:

- Maintaining existing bushfire breaks between adjacent landholders in particular along the boundaries where the State Planning Policy bushfire hazard mapping indicates there is a 'high' or 'very high' risk of bushfire occurring (refer to **Plan 13**).
- Cooperating with the local QRFS, SRRC and adjoining landholders to minimise bushfire risk at a regional scale.
- Undertaking a feasibility assessment on insurance for plant stock replacement.

The overall assessment of bushfire risk is that their occurrence is unlikely within the life of the offset and consequences of such an event would be moderate. With intervention and management, bushfire is evaluated as a moderate risk to this offset project. Refer to Appendix E for more details.

In the event a bushfire does occur within the offset area, adaptive management will involve:

- The provision of additional rehabilitation works where bushfire has occurred and damage or losses to plantings has resulted.
- Review of the adequacy of risk management measures to determine factors that may have resulted in the bushfire occurring and an assessment of any other management measures that could be implemented to reduce the risk further.

8.7. Management Action 5 – Habitat Creation and Regeneration

8.7.1 Justification

Habitat creation and regeneration is a key management action that will improve existing habitat values within the MVOAs 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 and under "Recovery Objective 1 – Action 1.4" of the GHFF National Recovery Plan. Rehabilitation aims to enhance degraded areas through Management Action 3 (WONS removal), excluding cattle grazing, large scale plantings in highly disturbed areas, and assisted natural regeneration. 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 sufficient to trigger the recovery process and natural regeneration. Planting only occurs where necessary (i.e. where large canopy caps exist) 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.

Benchmarks for rehabilitation efforts are derived from the definition of remnant vegetation under the *Vegetation Management Act 1999*. Vegetation can be mapped as remnant vegetation and associated essential habitat for Koalas if the canopy is 70% of the height, 50% of the cover and similar species composition of the appropriate pre-clearing RE (Queensland Government 2015). Therefore, the final benchmark at 20 years for rehabilitation is 50% of the reference benchmark cover (for canopy, shrub and ground-layer) and 70% of the reference benchmark height (for canopy and shrub layer) of the appropriate RE.

On-site regrowth regional ecosystem vegetation communities (OMU1) and pre-clear regional ecosystem communities (OMU2) indicate the MVOA contains a broad distribution of the following regional ecosystem type (Code plus Dominant Species):

- RE12.8.17 – *Mixed woodland with combinations of Eucalyptus crebra, E. melanophloia, E. tereticornis, Corymbia tessellaris, C intermedia woodland*
- RE12.3.3 – *Eucalyptus tereticornis woodland. Eucalyptus crebra and E. moluccana are sometimes present and may be relatively abundant in places, especially on edges of plains and higher-level alluvium*

The Queensland Herbarium biocondition benchmarks for RE 12.8.17 indicate remnant canopy tree height as 19 m and subcanopy 10 m, whilst the remnant tree canopy coverage is 48%, sub-canopy coverage 20% and shrub canopy coverage 5%. Therefore, once the AU2 and AU3 revegetation reaches 70% of these prescribed heights and 50% of these prescribed canopy coverages it can be considered remnant.

The Queensland Herbarium biocondition benchmarks for RE 12.3.3 indicate remnant canopy tree height as 25 m and subcanopy 9 m, whilst the remnant tree canopy coverage is 40%, sub-canopy coverage 8% and shrub canopy coverage 4%. Therefore, once the AU1 revegetation reaches 70% of these prescribed heights and 50% of these prescribed canopy coverages it can be considered remnant.

Within particularly disturbed areas of non-remnant vegetation, the objectives of this plan are long term and have the potential to take longer than 15 years after commencement of implementation, particularly as the Queensland Herbarium quotes that in general it takes 30 years for a disturbed site to regain remnant status. However, the goal of regeneration actions is to re-establish an ecosystem that is self-regenerating and self-sustaining and therefore will persist against disturbance (SEQ Restoration Framework, 2012). The SEQ Restoration Framework indicates that in order to achieve the self-sustaining ecosystem at least 2 – 5 years of implementation and maintenance needs to occur. Thus, the offset project provides a sufficient maintenance and implementation period that sets the revegetation areas towards remnant status following the completion of maintenance. Interim benchmarks via MHQA transects are to be conducted at regular intervals which will inform the progress of the rehabilitation/revegetation efforts towards achieving this plan's outcomes. Given this, adaptive management approaches can also be employed to redirect restoration approaches, if interim benchmarks are not being met.

8.7.2 Management Action Measures

The OMUs listed in **Section 8.2** will be established across the MVOA. They range from regrowth vegetation to cleared grazing paddocks, and as such the extent of native tree abundance and WONS infestation differs between these OMUs. Consequently, the key management actions across the OMUs will differ (refer below and **Table 60** for summary). Key management actions will include assisted natural regeneration practises to expand patches of regrowth throughout areas where high levels of weed management are required (OMU 1) and reconstruction and infill planting within the non-remnant areas to assist in vegetation coverage and composition (OMU2). A Detailed Rehabilitation Plan (RMP) has been developed to guide implementation of on ground works and is included as **Appendix F**.

Table 60: Operational Management Unit rehabilitation method summary

OMU	Description	Rehabilitation Method
Regrowth vegetation RE 12.3.3 and 12.8.17 (OMU 1)	Discontinuous to continuous canopy vegetation	• Assisted natural regeneration • Weed removal/control • Bushfire management • Infill planting where necessary • Cattle exclusion
Non-remnant vegetation, pre-clear RE 12.8.17 (OMU 2)	Cleared paddocks, sparse paddock trees	• Reconstruction • Weed removal/control • Bushfire management • Large scale planting • Cattle exclusion

On-ground works proposed within the OMUs include are detailed below.

OMU 1 - Regrowth vegetation, RE 12.3.3 and RE 12.8.17

- Implementation of rehabilitation techniques that aim to promote the regeneration of native vegetation and improve habitat values:
    - Where natural regeneration is ineffective, seeding with native endemic seeds,
    - Where natural regeneration and/or seeding is ineffective, planting of endemic trees and shrubs specifically selected to provide Koala/GHFF habitat.
- Stop activities reducing habitat values, specifically production grazing.
- Introduce management practices which support, and favour habitat increase (e.g. bushfire management)
- Removal of impediments to Koala movement such as old, unused fences
- Assisted natural regeneration practices where weed treatment results in open areas – replanting with locally endemic species (infill planting - if necessary only).
- Erosion rectification where required to allow natural regeneration to establish.
- Maintain and manage the land for the life of the offset, including direct monitoring of Koala/GHFF usage.

OMU 2 - Non-remnant vegetation, pre-clear RE 12.8.17

- Reconstruction and direct planting or seeding in cleared areas with endemic native trees and shrubs
- Implementation of rehabilitation techniques that aim to promote the regeneration of native vegetation and improve habitat values:
    - Where natural regeneration is occurring, supplementary seeding with native endemic seeds,
    - Where natural regeneration and/or seeding is ineffective, planting of endemic trees and shrubs specifically selected to provide Koala habitat.
- Assisted natural regeneration practices where weed treatment results in open areas – replanting with locally endemic species (infill planting)
- Removal of impediments to Koala movement such as old, unused fences.
- Introduce management practices which support and favour habitat increase (e.g. bushfire management)
- Maintain and manage the land for the life of the offset, including direct monitoring of Koala usage.

It is noted that AU1 and AU2 contain different regional ecosystems however these ecosystems are dominated by the same species and differ based on Land Zone however the proposed management actions remain the same.

Within the mapped regrowth areas, natural regeneration rehabilitation is less invasive and thus the preferred method to enhance vegetation. Where natural regeneration is unsuccessful, infill planting will be implemented to facilitate recovery (if required). In non-remnant areas where there is little vegetation, reconstruction will be required through encouraging natural regrowth, seeding and direct plantings.

8.7.2.1 Rehabilitation Methodology

A Detailed Rehabilitation Plan (RMP) has been developed to guide implementation of on ground works and is included as **Appendix F**. A process for how rehabilitation measures will generally be implemented s also provided below.

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

- The presence of highly invasive weed species which have potential disperse further prior to substantial site works commencing.
- The presence of weed species with the potential for 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. Response measures will be dependent on the issue but could include installation of temporary fencing if deemed appropriate.
- Improving internal site access through implementation of 4WD tracks to facilitate ongoing rehabilitation requirements.

Site works can be typically broken down into the following categories:

- Primary Works
- Follow-up Works
- Maintenance Works

<u>Primary Works</u>

Primary works, or initial works, within the MVOA or a section of the MVOA will commonly involve a sequence of activities such as the control of all 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 that will stimulate the germination of native and exotic species. Therefore, persistent works will be scheduled shortly after the initial visit to allow for timely control of any regenerating weeds. Highly invasive weeds, such as Lantana and Fireweed, will 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 MVOA 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 area to assess the progress of vegetation regeneration and determine whether follow up work is necessary. An area 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 have the potential to 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 be the primary aim (source: SEQERF).

Maintenance works include 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.

8.7.3 Management Action Responsibility

The Offset Provider is responsible for:

- Funding the appointment of trained and experienced bushland regenerators or revegetation contractors for the completion of all rehabilitation activities in accordance with the RMP (site preparation, planting, establishment and maintenance).
- Commissioning and funding tertiary trained ecologists for the survey, monitoring and reporting of interim and milestone revegetation outcomes.

8.7.4 Completion Criteria

Timing	Completion Criteria
Year 1	Complete Site Preparation work in accordance with RMP including: • Establish phot monitoring locations • Tilling / cultivating grazed grass areas for treatment of pasture grass seedbank in preparation for planting • Undertake soil testing for both the modified planting soil and for the planting locations • Commence seed collection and propagation in coordination with an external nursery
Year 3	Complete all offset area planting in accordance with planting palettes and densities proposed in the RMP provided weather conditions are suitable for broadscale planting
Years 1 – 20	Implement the RMP to ensure performance indicators are achieved particularly the mortality rate of plants (focusing on trees) is <20% during the contractor establishment phase (3 to 5 years)

8.7.5 Management Action Monitoring

A combination of informal and formal monitoring techniques are proposed as part of the offset program to allow for an effective monitoring regime that will promote adaptive management and high achieving offset outcomes. This includes methods prescribed in the RMP and habitat quality monitoring methods under the OMP.

Monitoring methods to track rehabilitation progress against the RMP will comprise a mix of informal and formal monitoring methods to track progress against the proposed environmental outcomes for each MNES and objectives of the RMP. A range of performance indicators have been nominated. All monitoring will be undertaken by a suitably qualified Rehabilitation Contractor and/or Ecologist.

Informal or qualitative monitoring techniques will be employed as part of the offset monitoring. Informal monitoring methods are less time-consuming and technical and form an important tool for determining ecological restoration success. Informal monitoring will occur through site inspections at prescribed monitoring intervals and will include the following techniques to be completed bi-annually for Years 1-5 and five-yearly at Years 10, 15 and 20.

1. Photo monitoring, and
2. Visual assessment.

Photo monitoring locations (2-4 per OMU) will be established in Year 1 prior to works commencing.

Formal monitoring of rehabilitation works involves collecting quantitative data at prescribed monitoring intervals using a combination of monitoring methods and techniques. Formal monitoring provides data that cannot be measured by informal observations and can be easily compared against quantitative attributes. Formal monitoring will be completed at 5-yearly intervals (5, 10, 15 and 20 years) following the commencement of the offset with specific measures to include:

- MHQA and FHA transects completed in accordance with the baseline survey methodologies described in **Section 3.3.1 and 3.3.2**.
- Koala SAT surveys as described in **Section 6.1.2**.
- Motion triggered camera trapping as described in

Refer to Appendix F for further details regarding the proposed monitoring methodology within the RMP.

8.7.6 Management Action Reporting

Photo Monitoring Reports

The results of informal (photo monitoring and visual assessment) will be detailed in bi-annual/five-yearly monitoring reports. Following each photo monitoring event, a Photo Monitoring Report will be prepared which will include the following information:

- Photo set at each monitoring location.
- Commentary on mortality rate and presence of WONS/other weeds at a minimum with any additional relevant observations to inform adaptive management such as species-specific responses or herbivory.
- Adaptive management (if required).

These reports will include commentary of overall success rate (namely of tree species), any degrading factors at the site that may or are currently affecting survival success and any recommended adaptive management measures.

Milestone Reporting

Formal monitoring will be completed by a suitably qualified ecologist before the end of Years 5, 10, 15, and 20 of the offset to assess against the interim milestones and environmental outcomes (see **Table 47** to **Table 52**).

Offset Area Annual Reports

Rehabilitation progress will be reported by the suitably qualified regeneration contractor or Offset Provider in the OAAR. The suitably qualified regeneration contractor will complete annual monitoring tasks until establishment of plantings is achieved (typically between three to five years).

8.7.7 Management Action Adaptive Management

Multiple corrective action triggers for adaptive management will be adopted. This includes:

- Native plant mortality >20% during the initial contractor establishment phase (3-5 years) of the plantings
- WONS cover >5% after Year 10

A survival rate of 80% of tree species will be achieved for the offset area. The 80% survival rate is to be achieved throughout the 3-5 year contractor establishment phase, after which the plantings are considered self-sustaining. It is anticipated the overall density of plantings will normalise to typical eucalypt forest density during the successional phase of the offset (5-20 years post planting).

Where survival rates are observed to be less than 80% as per qualitative and quantitative monitoring methods during the contractor establishment phase, this may indicate the presence of a degrading factor not previously identified or considered at the site and may require adaptive management measures to be considered and

implemented. Degrading factors are to be identified as part of regular monitoring and will form the basis for actioning adaptive management.

Adaptive management measures may include a combination of the following:

- Identify and address the degrading factor (e.g. soil issue, pests, species failure).
- Remedial plantings in areas of dieback to bolster survival rates to above 80% during the contractor establishment phase.
- Introduce a different species i.e., if one plant species consistently dies on a site, consider using in its place a species that is performing well.
- Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques.
- Modify weed management techniques or frequency where WONS exceed 5% after year 10.

8.8. Management Action 6 – Fencing and Signage

The MVOA is to be suitably fenced and marked with signage to discourage trespass, indicate biosecurity restrictions, and keep out cattle. Gates leading to the MVOA will have signage installed for added protection.

In addition, cattle will be managed as specified in this OMP via a combination of temporary and existing paddock fencing and, in time, temporary fencing will be upgraded where required to permanent or removed when the broader offset property as land is secured as an offset and managed under approvals.

Fences that include barbed wire will also be retrofitted to further reduce threats to the GHFF. Barbed wire should be removed from the top strand or covered with poly pipe (Bat Conservation & Rescue Qld Inc. (2022)) or tagged to reduce potential impacts to the threatened species Where the MVOA is adjacent to other EPBC approved offset areas in the future, fencing will be removed altogether to facilitate movement.

For proposed MVOA fencing and signage, **Plan 14** shows existing barbed-wire fencing that will be retrofitted or replaced with fauna friendly fencing in accordance with the Koala Sensitive Design Guidelines (DES 2022). New fencing will also be installed to exclude livestock where required.

8.8.1 Management Action Measures

Management actions to reduce the risk of livestock control and access and trespass management impacts on the offset property include:

- Ownership of the MVOA land by the offset provider and therefore any residual grazing activities will be secondary land uses to the approved offset outcomes.
- Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land.
- Retrofitted or replace barbed wire with fauna friendly fencing in accordance with the Koala Sensitive Design Guidelines (DES 2022).
- Livestock to be excluded from the MVOA on approval of the VDec with Fauna friendly livestock exclusion fencing installed around the perimeter of the wider MVOP within 6 months.

8.8.2 Management Action Responsibility

The Offset Provider is responsible for funding and undertaking all actions relating to fencing and signage.

14. OFFSET AREA FENCING



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

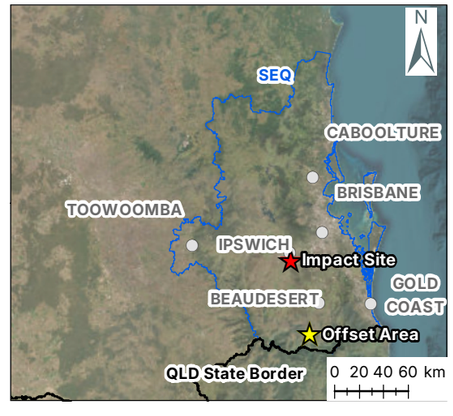
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Updated data available at

LEGEND

- Qld DCDB
- Offset area
- Mount View offset property

Indicative Fencing

- Existing barbed wire fencing to be retrofit with fauna-friendly fencing
- New fauna-friendly fencing or existing barbed wire fencing to be retrofit with fauna-friendly fencing



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Transverse Mercator
GDA 2020 | Zone 56
1:4,000
@ A3

Address / RPD: Binnies Road, Ripley

9/02/2026

11826 E 17 Offset Area Fencing A

8.8.3 Completion Criteria

Timing	Completion Criteria
Year 1	• Inspection and rectification of all external fence boundaries • Removal of all unnecessary barbed wire fencing within offset area
Year 1 – 20	• Maintain offset area perimeter fencing and signage at vehicle access points to prevent unauthorised access to offset area • No new access tracks through offset unless to support offset outcomes

8.8.4 Management Action Monitoring

The Offset Provider will monitor all fence lines at least quarterly or as required to detect:

- Areas of disrepair requiring maintenance; and
- Evidence of trespass and unauthorised activities.

8.8.5 Management Action Reporting

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent for each offset period for inclusion in the Approved Project Annual Compliance Report.

8.8.6 Management Action Adaptive Management

Triggers for adaptive management may include evidence of repeated unauthorised vehicle track use or evidence of multiple breaches by cattle. Adaptive management for general trespass management and unauthorised offset area activities includes:

- More frequent fence line monitoring
- Use of photo monitoring at strategic locations or where breaches have occurred
- Review of offset area signage, locations and install additional signage where necessary
- Installation of soft physical barriers such as logs or rocks at track heads where there is evidence of unauthorised access

Enforcement options are available if necessary, however, it is considered a last resort where adaptive management measures are ineffective. Further, access restrictions will be detailed in the covenant terms providing a pathway for enforceable action where required.

8.9. Monitoring and Reporting Framework

8.9.1 Report Types

A range of report types will be prepared as part of the overall offset monitoring. The report types, timing and responsible party for each of the reports are detailed in **Table 61**.

Table 61: Summary of Reports Required and Responsible Parties

Report	Purpose	Frequency	Responsible party
Offset Area Annual Report **Details implementation of management actions against the OMP and RMP including rehabilitation progress review.**	Designed to document all offset activities completed and/or commissioned by the Offset Provider and demonstrated against the timeframes and completion criteria of the OAMP and includes a review and progress update of rehabilitation works (planting and weed management). Required as part of the commercial agreement between the Proponent, to be provided (1) month after each year of the offset.	Annually following the legal securement of the offset area	Offset Provider
Milestone Survey Report **Details the results of MHQA,** and **GHFF FHA habitat assessment.**	Designed to demonstrate increase in value of offset area for Matters of National Environmental Significance (koala, grey-headed flying-fox, swift parrot and regent honeyeater) as proposed under the OMP. 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.	Five-yearly at Years 5, 10, 15 and 20	Suitably qualified Ecologist as appointed by the Proponent
Photo Monitoring Report **Qualitative monitoring report showing photos of the offset area, commentary on rehabilitation progress and recommended adaptive management measures.**	Designed to provide regular assessment of the offset area and feedback to engaged rehabilitation contractors to guide on-ground works.	Bi-annually from Years 1 to 5 Five-yearly at Years 10, 15 and 20	Suitably qualified Rehabilitation Contractor or Ecologist as appointed by the Offset Provider
Annual Compliance Report **Required to be prepared as part of the approved project decision notice.**	Designed to document activities and demonstrate compliance against the EPBC Act approval conditions for the project. Other subsidiary reporting may be included as evidence of compliance with approval conditions.	Annually, timing specified in approval conditions	Suitably qualified person as appointed by the Proponent

8.9.2 Annual Compliance Report Inclusions

ACRs will be completed in line with ACR Guidelines for EPBC reporting. Ultimate inclusions within an ACR will be subject to the final approval documents (Preliminary Documentation and OMP) and the approval conditions. The following headings/section titles will be included within ACRs. Milestone Reports will be included with the ACR where required.

General Descriptions

- Approval Details
- Reporting Period
- Roles and responsibilities
- Description of Key Activities

Impact Management Details

- Commencement of the Action
- Vegetation clearing protocols and pre-starts
- Review of Impacts
- Fauna spotter catcher reports
- Other mitigations measures proposed (i.e exclusion fencing)

Mount View Offset Area Management

- Offset Area securement
- Offset Area management activities
- Performance and completion criteria relevance (detailed in milestone reports)
- Monitoring and adaptive implementation outcomes

Compliance

- Non-compliance matters
- Approval conditions compliance table

8.9.3 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.

8.9.4 Monitoring and Reporting Schedule

A monitoring and reporting schedule has been provided in **Table 62** detailing when and who is responsible for the various reports required to ensure management actions are occurring. A diagram has been provided as **Insert 1** detailing how various management plans are relevant.

8.10. SMART Principle

The SMART principle is a widely adopted framework for setting effective objectives. It ensures that goals are:

- Specific – Clearly defined and focused.
- Measurable – Quantifiable to track progress.
- Achievable – Realistic and attainable within available resources.
- Relevant – Aligned with broader objectives and priorities.
- Time-bound – Linked to clear deadlines or timeframes.

Applying SMART to environmental offset management ensures that actions are transparent, auditable, and deliver tangible ecological outcomes.

The Offset Management Plan for the Mount View Offset Area (MVOA) integrates SMART principles across all management actions. Each action is:

- Specific: Clearly described tasks such as legal securement, weed control, pest management, bushfire planning, habitat restoration, and fencing are described.
- Measurable: Defined performance targets and completion criteria (e.g., <5% weed cover by Year 10, Koala MHQA uplift from 4 to 8).
- Achievable: Based on proven, industry best practice ecological restoration methods, supported by baseline surveys and confidence levels (75–85%).
- Relevant: Directly addresses EPBC Act offset requirements, conservation advice, and recovery plans for Koala and Grey-headed Flying-fox.
- Time-bound: Includes clear timelines for implementation and monitoring (Year 1 securement, Year 2 planting, annual reporting and milestone reviews at Years 5, 10, 15, and 20).

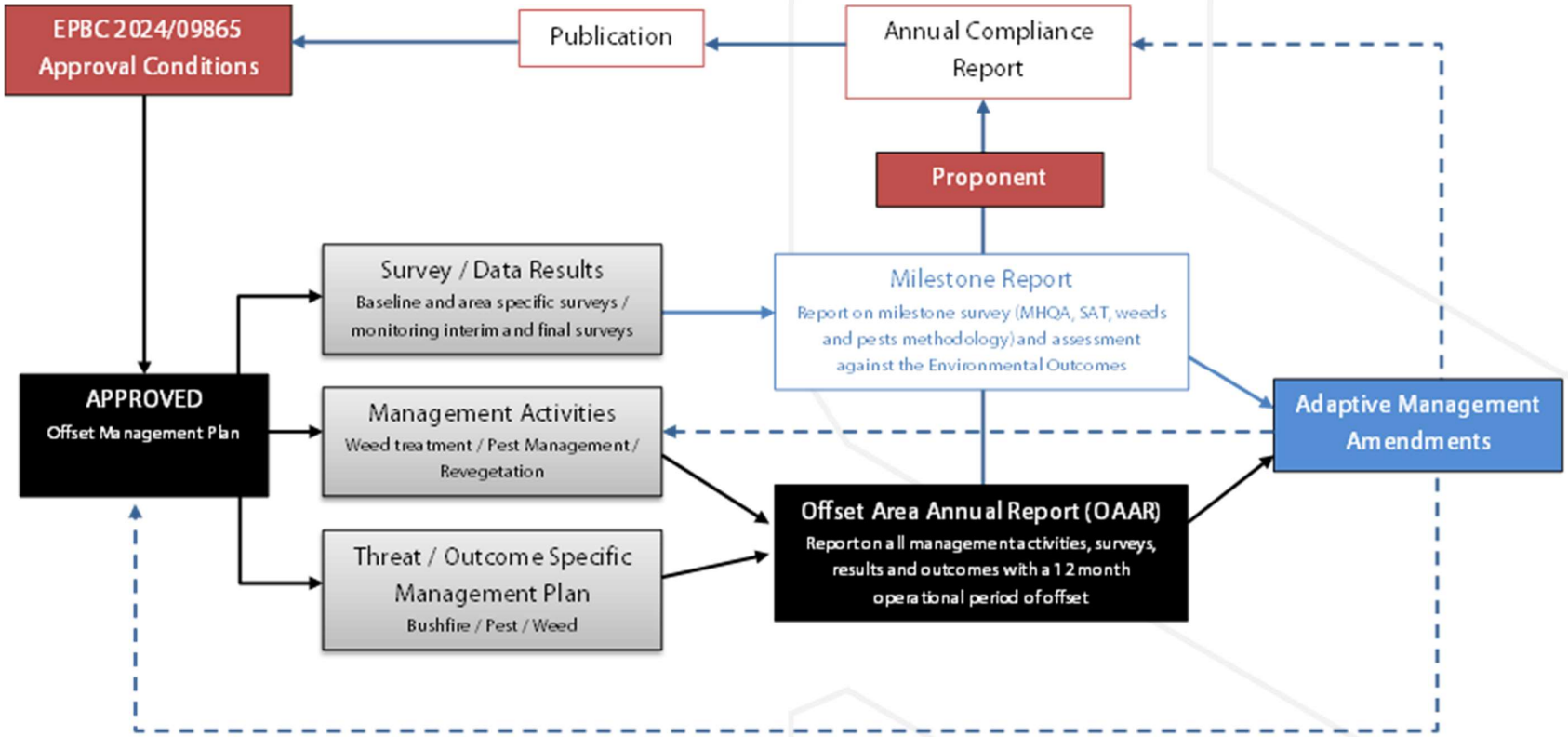
The application of the SMART principle to management actions is summarized in **Table 63**.

Table 62: Timeline for monitoring and reporting actions

Management action	Monitoring action(s)	Reporting action and timing	Responsible person(s) for activity/reporting
1 – Legally secure MVOA	The MVOA is legally secured within 12 months of the approval. Legal securement will be completed via a Voluntary Declaration (VDEC) administered under the *Vegetation Management Act 1999* (Qld). A covenant will be completed under either Chapter 6 Part 4 Division 8A of the Land Act 1994 (Qld) or Part 6 Division 4A of the Land Titles Act 1994 (Qld). If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW.	The Department will be notified that the MVOA 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. Evidence in the form of a registered covenant will be provided to DCCEEW within 20 business days of registration. Details will be included in the Annual Compliance Report (ACR).	Suitably qualified person as appointed by the Proponent
2 – Non-native vertebrate pest management	Monitoring will occur before the end of Milestone Report years and will include a repeat of baseline survey methodologies (i.e., motion triggered detection camera deployment) and sightings (direct and indirect) with evidence of non-native predators GPS recorded.	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.
	Evidence of pest presence within the MVOA and pest management implementation will be extracted from the MVOA Annual Report (OAAR) and 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	Photo monitoring will be completed annually during the first five (5) years of the offset and recorded in the OAAR to document on-ground progress. Monitoring will be reviewed as part of the 5 year milestone reporting and continue if weeds persist at the site.	An OAAR will be completed within one (1) month of the end of each offset year detailing WONS management implementation and progress against	Offset Provider and suitably qualified weed management contractor as appointed by the Offset Provider.

Management action	Monitoring action(s)	Reporting action and timing	Responsible person(s) for activity/reporting
	Photo monitoring coordinates will be recorded and occur in the same location each survey period. Weed cover surveys and mapping, and MHQA surveys will be conducted before the end of Milestone Report years in accordance with baseline survey methodologies to track progress against interim milestone targets and completion criteria and identify any issues for rectification. 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.	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.	Suitably qualified person as appointed by the Proponent.
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 recommended 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 contractor.	An OAAR will be completed within one (1) month of the end of each year to document: • Planting/seedling events, • Watering schedule, • Implemented corrective actions, • Success/failure rates within initial maintenance period/watering period until establishment. • Certificate of practical completion of planting works;	Offset Provider and suitably qualified bush regeneration contractor as appointed by the Offset Provider.

Management action	Monitoring action(s)	Reporting action and timing	Responsible person(s) for activity/reporting
	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.	• Certificate/sign off that establishment has been reached. 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.	Suitably qualified person as appointed by the Proponent.
6 – Fencing and signage	Status of fencing and signage and any issues requiring rectification will be identified through monthly 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



Insert 1: **Diagram of reporting requirements**

Table 63: Application of SMART Principles to Management Measures

Management Action	Specific	Measurable	Achievable	Relevant	Time-bound
Legal Securement	Legally protect MVOA under Voluntary Declaration	Declaration completed	Process supported by legislation	Meets EPBC offset requirement	Prior to commencement of the action
Weed Management	Target WONS using best practice methods (Lantana, Fireweed)	<5% cover by Year 10	Uses SEQ best practice restoration methods	Improves Koala & GHFF habitat	All weeds treated within 18 months
Pest Control	Control Wild Dogs, Cats, Foxes, Pigs	Zero evidence in monitoring	Nationally endorsed strategies	Reduces predation on Koalas	Ongoing from Year 1
Bushfire Management	Implement Bushfire Management Plan from qualified expert	Fuel load reduction will be documented	Plan aligns with QLD guidelines and industry standards	Protects offset vegetation	Annual review
Habitat Restoration	Assist natural regeneration & planting	Koala MHQA uplift to >7.5	Uses SEQ best practice restoration methods	Restores critical habitat	Progress reported in detail every 5 years
Fencing & Signage	Install & maintain exclusion fencing	Installation within 12 Repairs within 2 weeks	Standard fencing practices	Prevents livestock intrusion	Implemented year 1 & ongoing

9. Adaptive Management

Adaptive management processes for each management action are outlined in **Section 8**. 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 Offset Management Plan which do not result in a material change to the environmental outcomes, performance and completion criteria will be made by the Offset Provider and/or The Proponent without the requirement of approval from DCCEEW (however a copy of OMP changes will be sent to DCCEEW for record keeping).

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 and GHFF.
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 should new threats be identified or stochastic events such as floods, drought, cyclones, or unplanned fires.
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 floods, cyclones, or unplanned fires.

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.

9.2. 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.

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)
- The National Recovery Plan for the Grey-headed Flying-fox *Pteropus poliocephalus* (DAWE, 2021)
- *EPBC Act Survey guidelines for Australia's threatened bats* (Department of the Environment, Water, Heritage and the Arts, 2010);
- 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*.

9.3. 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 may 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.

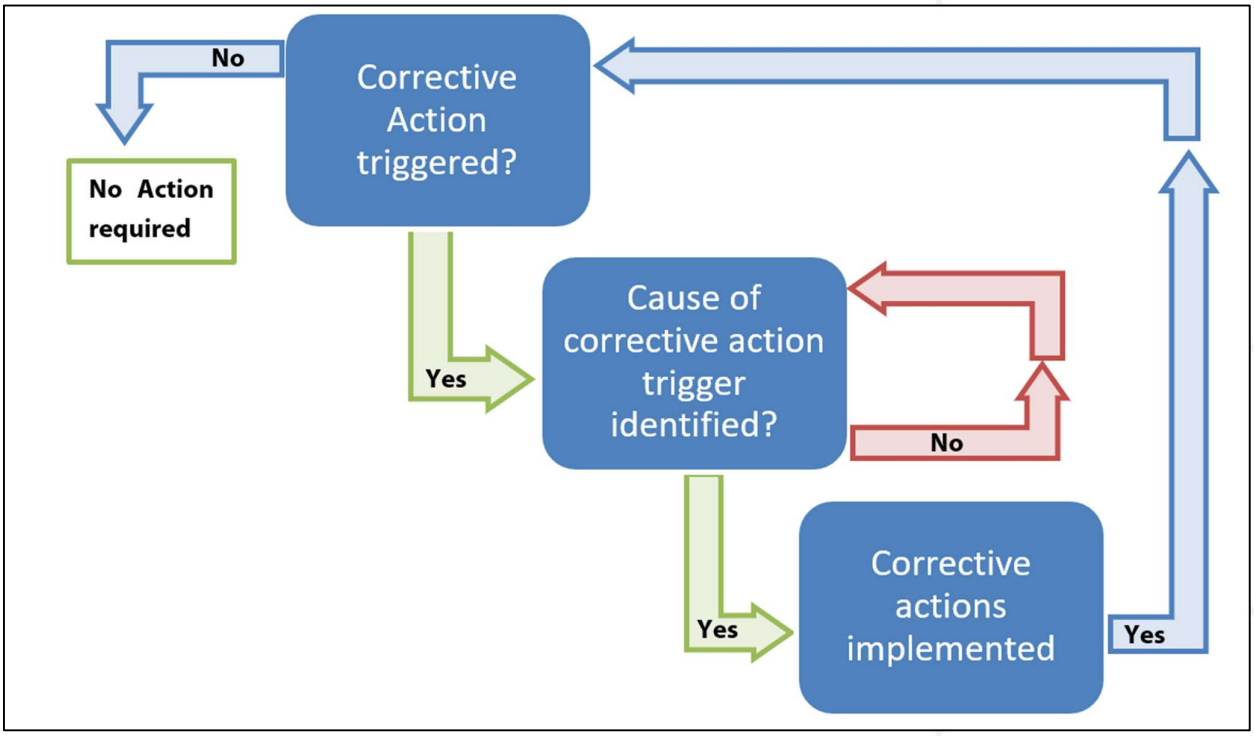
To identify the risk of failure, **Table 64** states the management action, completion criteria, corrective action triggers and corrective actions. In addition, a risk assessment has been completed in **Appendix E**.

9.3.1 Corrective Action Flowchart

Table 64 identifies corrective action triggers and actions however it is equally relevant to identify the cause of corrective action triggers in the adaptive management process. Identifying the cause of triggers allows suitable

management actions to occur while also minimising the risk of repeat events. **Insert 2** broadly details the process of corrective action trigger through to corrective actions occurring.

To ensure suitable corrective actions are implemented, it is necessary for the cause of the corrective action trigger to be identified. Only when the cause is identified can suitable management take place.



Insert 2: Corrective actions flowchart

Table 64: Risk of failure table and corrective actions

Action	Completion Criteria	Corrective Action Trigger	Potential causes of corrective action being triggered	Corrective Action
Legally secure the MVOA	The MVOA is legally secured via a Voluntary Declaration (VDEC) administered under the Vegetation Management Act 1999 (Qld). A covenant will be completed under either Chapter 6 Part 4 Division 8A of the Land Act 1994 (Qld) or Part 6 Division 4A of the Land Titles Act 1994 (Qld). If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW. The Department is notified of the legal securement within 5 business days of commencing the implementation of the OMP *i.e.,* the date from which the MVOA is legally secured. The MVOA is not used for other purposes – site access is restricted.	MVOA is not legally secured.	Administrative issues or timings	The MVOA is legally secured prior to commencement of the action. Covenant to be registered within 12 months of commencing the action. If a covenant is not possible alternative options will be discussed with DCCEEW.
Non-Native Vertebrate Pest Management	Reduced risk of injury or death of Koala from non-native predator attacks within the MVOA. Non-native vertebrate pests and evidence of pests (predator and/or herbivore) are suppressed below 5% within the MVOA.	Pest management is not implemented and risk of predation on Koalas is not reduced. Evidence of Koala mortality through predation is observed Monitoring actions and OAARs identify ongoing presence of predator pest species above the baseline levels.	The suitably qualified pest management contractor will investigate the cause of the corrective action trigger. Examples of causes include: • Climatic conditions promoting pest abundance • Management methods not successful to supress pests • New den site in local area	Where the risk of injury or death of Koala from non-native predator attacks has increased, by either an increase in relative abundance from baseline levels or by direct evidence of injury or mortality, corrective actions will occur within 3 months. These actions include supplementary control measures, such as increase frequency of control events and other management actions as recommended by suitably qualified pest contractor. Corrective actions will occur until target pests have been reduced as guided by the suitable qualified pest contractor.

Action	Completion Criteria	Corrective Action Trigger	Potential causes of corrective action being triggered	Corrective Action
		Monitoring actions and OAARs detect an increase in non-native predators from the previous survey or relative to the baseline. Non-native predators, are recorded within the MVOA.		Corrective actions will occur within 3 months of a monitoring event where non-native predator detection has increased from baseline. Where recurrent pest animal species (predator and/or herbivore) are detected, re-engagement to re-deploy management measures. Where there is evidence of non-native predator activity, a trapping or baiting program by a suitably qualified pest contractor will be conducted within 3 months of detection until such time the target species has been reduced as guided by the suitably qualified pest contractor. 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 key milestones and performance criteria is not achieved by the timeframes outlined, the corrective actions will continue until achieved, extending the management period.
WONS management	The management actions must reduce the extent of or maintain WONS weed cover below 5% of the MVOA by the end of Year 10 and be maintained for the life of the offset (20 years).	Weed cover has increased or remained constant relative to the previous monitoring event. The extent of weed cover has not been reduced as required to reach the environmental outcome as identified in the OAARs and Milestone Reports.	Investigate the cause of the correction actions being triggered. Example causes include: • Climatic conditions promoting weed spread • Adjacent land management practices • Weed spread from vehicle access or machinery • Infrequent or unsuccessful weed management techniques	Weed control program will be expanded/adapted to improve outcomes within 3 months following a monitoring event where the weed extent has not decreased or been maintained. Risk management, corrective actions and adaptive management will be integrated as required throughout the offset management period in response to changes or natural events. If key milestones and performance criteria are not achieved by the timeframes outlined in **Table 47** to **Table 52** the corrective actions will continue until achieved, extending the management period.

Action	Completion Criteria	Corrective Action Trigger	Potential causes of corrective action being triggered	Corrective Action
Bushfire management	Reduced risk of high intensity fires in the MVOA. Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes. Firebreaks and fuel loads are maintained through the life of the offset.	Bushfire management measures not implemented and/or a high intensity bushfire impacts the MVOA. Unexpected bushfire event and resurgence of weeds/decreased habitat. Inappropriate fire regime negatively impacts vegetation composition and restoration	Investigate the cause of the correction actions being triggered is to be completed. Example causes include: • Climatic conditions • Accidental ignition by people or machinery • Bushfire management measures unsuitable	Following annual monitoring of fuel loads, implement actions as directed by the local authority (example actions include prescribed burning undertaken in consultation with the Queensland Rural Fire Brigade) to manage fuel loads within 3 months or as soon as safe to implement. 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 evidence of vegetation composition decline because of inappropriate fire regimes is observed re-assessment of the Bushfire Management Plan will occur, and remedial works will occur within 3 months or when conditions are favourable. In the event of bushfire, undertake audit to inspect impacts within 2 weeks of the event (or as soon as it is considered safe to access) and identify if any MNES mortality or injury has occurred. The audit will identify the need for recovery actions including weed control and management and infill planting to ensure the habitat quality performance criteria are achieved within the management period. Any recovery actions will be commenced within 3 months following the audit or when weather conditions are favourable.
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 expected cover according to the relevant	Regeneration measures not implemented as proposed; Site Condition metrics do not improve according to proposed	Investigate the cause of the correction actions being triggered is to be completed. Example causes include: monitoring): • Climatic conditions	Appropriate rehabilitation techniques will be implemented in accordance with the rehabilitation plan (Appendix F) within 3 months of the MHQA survey intervals.



Action	Completion Criteria	Corrective Action Trigger	Potential causes of corrective action being triggered	Corrective Action
	Regional Ecosystem benchmark to be reached. Site Condition metrics for Koala and GHFF improves in accordance with environmental outcomes (see **Table 47** to **Table 52**).	environmental outcomes. OAARs indicate that the rate of plant stock failure is greater than 10%. Habitat does not achieve performance criteria as identified in Milestone Reports within the management period, implement corrective actions.	• Unsuitable methods of habitat creation or regeneration • Infrequent or insufficient monitoring/maintenance	Monitoring will be undertaken monthly until establishment 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 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 will be extended to ensure environmental outcomes are able to be achieved if required.
Fencing and Signage	Mortalities or injury to Koala or GHFF recorded as a result of fauna friendly barbed-wire fencing is rectified within 2 weeks of being recorded. Stock breaches or unauthorised access is rectified as soon as possible once the breach has been identified.	Fencing or signage not installed or retrofitted as proposed causing Koala injury, stock breaches, or other unauthorised access.	Investigate the cause of the correction actions being triggered is to be completed, i.e. continued stock breaches will require additional management actions • Fencing type or extent not suitable • Illegal access	Monitoring of fencing will be undertaken monthly by the Offset Provider to identity damaged fencing or Koala/GHFF mortalities as a result of fencing. Cattle or other stock animals are to be removed from active rehabilitation areas as soon as possible once a breach has been identified and excluded from the area until repairs occur. Any damaged fencing is repaired within two weeks of being recorded if possible (i.e weather conditions suitable).
Stochastic or nuisance events	While such events (e.g. fire, flood, drought, vandalism etc) are rare and can be managed by the contractor, where events take place, restoration works are to replace	Evidence of damage to revegetation plantings and/or fencing as a result of extreme weather	Investigate the cause of the correction actions being triggered is to be completed.	Inspection of the MVOA will occur within a month of the extreme weather event (if safe to do so) to assess plant stock and fencing.



Action	Completion Criteria	Corrective Action Trigger	Potential causes of corrective action being triggered	Corrective Action
	losses and reporting to the DCCEEW is required	events, natural disaster or vandalism.	• Cause internal or external to offset site	Implement supplementary planting and revegetation measures within 3 months of extreme weather events. Repair any fencing damage within 3 months of extreme weather event. Evidence of impacts and rectification measures are to be issued to the DCCEEW within 3 months.

9.4. Climate Change

In addition to the risk of failure, corrective actions and triggers of the key management actions detailed in **Table 64**, the risk Climate Change imposes on the MVOA has been included in this section and includes the following:

Wildfire

The offset land retains little vegetation, however, its proximity to surrounding vegetation increases the risk of wildfire on the site, and as such, it is reflected as medium to high-risk fuel loads for wildfire in State Government Mapping (**refer to Plan 13**). A review of QGlobe fire scar mapping overlay indicates the northern portion of the MVOA was exposed to wildfire in 2024, 2021, and 2020. The offset land retains vegetation through the main gully line in the east and interspersed with open paddocks. The MVOA includes a minimal system of boundary line firebreaks and access tracks for the protection of stock and farming infrastructure. This fire management system will be evolved and maintained as parts of the site transfer from open pasture to revegetation as specific Offset Works are sequentially completed.

Wildfire Management Actions:

- Maintain the existing bushfire breaks between adjacent land holders and access tracks through and around areas of mature and regrowth vegetation.
- Establish new tracks and fire breaks as necessary as part of the increased vegetation cover created through revegetation and rehabilitation.
- Establish an MVOA Wildfire Management Plan which caters for excessive dry periods and/or high-risk build-up of wildfire fuel loads. If necessary, undertake mosaic understory low intensity back burning exercises to reduce fuel load risks.
- Work with local Qld Rural Fire Brigade, Scenic Rim Regional Council representatives and adjoining landowners to minimise wildfire risks at the regional scale.
- Consider insurance for plant stock replacements.

Flooding

The local township of Rathdowney and surrounding creek and river catchments are known to periodically flood. However, despite Dip Creek occurring through the east of the MVOA no Local or State flood mapping occurs within the site. Dip Gully may experience flash flooding during significant rainfall events however as the entirety of the offset is outside of potential flood prone areas, the potential flood risk is considered low.

Flooding Management Actions

- Include stabilization matting, tree stakes, etc for plantings within higher risk zones of erosion from rising flood waters or fast movement channel or embankment flows, such as within gully lines.

Drought

According to the nearest Bureau of Meteorology rainfall Station (040754), the MVOA received significantly lower annual rainfall in 2019, a total 236 mm, well below the annual average of 781.3 mm. This suggests the region

can be severely impacted by drought. However, rainfall data to September for 2025, is at 700.8mm mm, and thus already near the total average annual rainfall.

Climate Change Adaptation Strategies for the Koala prepared by Christine Adams-Hosking concluded that the highest probability of Koala presence occurred at a mean annual rainfall of 700 mm (Adams-Hosking, et al, 2011). Therefore, despite unprecedented drought conditions, the offset site has maintained an average annual rainfall amount >700 mm, similar to the optimal range to support Koala presences. Preparation and management will still be key in maintaining resilience and habitat value long-term as extreme weather conditions become more frequent.

Drought Management Actions:

- Ensure offset design includes replanting and connection to higher moisture content soils associated with alluvial and riparian areas of the broader site.
- Maintain existing drainage features in offset rehabilitation works and as water sources for native animals.

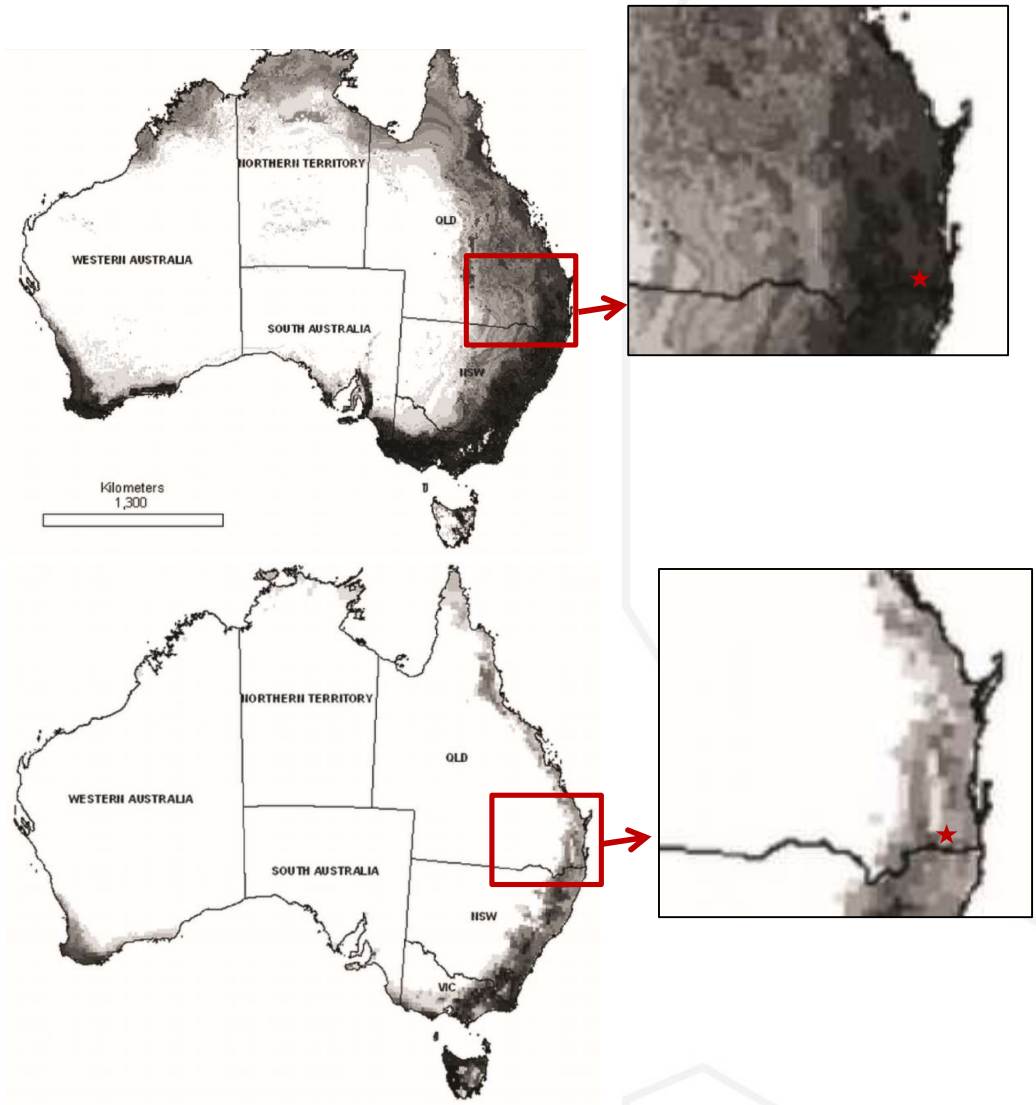
Climate Factors - Shifting Habitat Range

Several contemporary case studies and research papers have investigated the impact of combined climate change weather characteristics on the current and future distribution of suitable Koala habitat. Koalas are particularly affected by changing and/or extreme climate conditions as they have a low tolerance for environmental change and are already threatened by a variety of anthropogenic factors such as increased disease, vehicle strike, and habitat destruction and fragmentation. The high mobility of Grey-headed Flying-fox allows a higher level of adaptability, but both species and their habitat have been recently affected at a national level by the 2019-2020 bushfires. As such, large-scale extreme weather events as well as continuous shifts in weather patterns may alter the distribution of these species.

The Climate Change Adaptation Strategies for the Koala by James Cook University (JCU) applied climate change distribution models for the Koala and five of its essential food trees to a conservation prioritisation framework ('Zonation') to determine which Queensland local government areas (LGAs) were the highest priority for Koala conservation and adaptation. The study included current (2011) and predicted (2070) Koala habitat distribution which showed a substantial eastward migration. The study further concludes that:

"*The highest probability of Koala presence occurred at a mean maximum summer temperature of approximately 27°C and a mean annual rainfall of approximately 700 mm*" (Adams-Hosking, C, *et al.*, 2011). Modelling climate-change-induced shifts in the distribution of the Koala. Wildlife Research, 38, 122–130)

As previously stated, average annual rainfall near the MVOA is 781.3 mm. Additionally, the land is also located within the current and 2070 Koala habitat distribution maps based on the A1F1 climate change scenario (Adams-Hosking, *et al*., 2011). Therefore, the MVOA is within an ideal location to protect Koala habitat in the face of shifting habitat range associated with Climate Change. Refer to **Insert 4** for estimated location of the Offset Site based on predicted changes in habitat distributions in 2070.



Insert 4: Modelled Habitat Distribution – Adams-Hosking, et al. 2011. *Top:* 2011 distribution. *Bottom:* predicted 2070 distribution. Darker shading indicates a higher probability of Koala occurrence. MVOA indicated by red star.

9.5. Limitations

Although an adaptive management plan will be implemented across the MVOA 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 MVOA 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 implementation of the various described management actions along with continuous abundance monitoring will promote suitable habitat on site and encourage species utilisation.

Further, regular review of this Offset Management Plan inclusive of the management actions and monitoring methodologies detailed within it will assist in identifying areas for improvement, as well as identify successful methodologies. Whether management plans or on-site works have had success or required amendments will be assessed annually during the completion of the ACR.

To ensure correct assessment of the progress towards environmental outcomes and completion criteria, baseline surveys have been developed to be repeatable and comparable 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 MVOA.

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11. Appendices

Appendix A

- Koala MHQA scores (Impact area)
- GHFF FHA scores (Impact area)

Appendix B

- Mount View Offset Area –
- Koala MHQA scoring (Baseline)
- GHFF FHA scoring (Baseline)

Appendix C

- Mount View Offset Area
- Raw MHQA and SAT data
- Raw Weed Cover data

Appendix D

- Offset Assessment Guide Calculator results

Appendix E

- Risk Assessment

Appendix F

- Rehabilitation Plan

Appendix A

Koala MHQA scores (Impact area)

GHFF FHA scores (Impact area)

Impact site – AU1 (Koala) MHQA

Assessment Unit - Regional Ecosystem	AU 1 - Koala habitat RE12.9-10.2					
	RE12.9-10.2 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	6	8	7	7.5	125.00	5
Native plant species richness - shrubs	7	6	6	6	85.71	2.5
Native plant species richness - grasses	7	5	3	4	57.14	2.5
Native plant species richness - forbs	13	3	3	3	23.08	0
Tree canopy height (Canopy)*	21	18	18	18	85.71	5
Tree canopy height (Sub-canopy)*	12	10	10	10	83.33	5
					*Average tree canopy height	5
Tree canopy cover (Canopy)**	64	59.9	68.5	64.2	100.31	5
Tree canopy cover (Sub-canopy)**	20	35.2	20.6	27.9	139.50	5
					**Average tree canopy cover	5
Shrub canopy cover	6	5.6	7.3	6.45	107.50	5
Native grass cover*	21	25	2	13.5	64.29	3
Organic litter*	48	68	86	77	160.42	5
Large trees (euc plus non-euc) (per ha)	38	18	4	11	28.95	5
Coarse woody debris (per ha)	506	159	196	177.5	35.08	2
Non-native plant cover	0	10	3	6.5	6.50	5
Quality and availability of food and foraging habitat	NA				-	10
Quality and availability of shelter	NA				-	10
					Site Condition Score (/100)	70
					Overall Site Condition Score - out of 3	2.10
SITE CONTEXT						
Size of patch	10					10
Connectedness	5					0
Context	5					4
Ecological Corridors	6					6

Role of site location to species overall population in the state	5					5
Threats to the species	7					7
Species mobility capacity	4					4
					Site Context Score (/56)	36
					Overall Site Context Score - out of 3	1.93
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70					40
					Species Stocking Rate Score (/70)	40.00
					Overall Species Stocking Rate Score - out of 4	2.29
Overall Assessment Unit Score						6.31

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	40/70
Species Stocking Rate Score – out of 4	**2.29**

*SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Impact Site – AU1 (GHFF) FHA

Assessment Unit - Regional Ecosystem	AU 1 habitat patches - RE12.9-10.2				
Site Reference	Transect 1	Transect 2	Average	AU Score	OUT OF
	Raw Data	Raw Data	Score		(X/X)
Vegetation Condition	Cat B	Cat B	20.00	20	20
Species Richness	6.0	5.0	5.50	10	20
Flower Score	0.623	0.637	0.6300	8	10
Timing of Biological Shortages	10	10	10.00	10	10
Quality of Foraging Habitat	4	4	4.00	10	20
Non-native Plant Cover	10.00	3.00	6.50	10	20
Site Condition Score				68	*X*
MAX Site Condition Score				*100*	*X*
Site Condition Score - out of 4				2.72	*X*
Size of patch	10	10	10	10	10
Connectedness	6	6	6	6	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	10	10	10	10	10
Site Context Score				43	*X*
MAX Site Context Score				*60*	*X*
Site Context Score - out of 3				2.15	*X*
GHFF Foraging Tree Density - Recorded	59	42	50.50		
GHFF Foraging Tree Density - per hectare	295	210	252.50	8	10
Species Stocking Rate Score				*8*	*X*
MAX Species Stocking Rate Score				*10*	*X*
Species Stocking Rate Score - out of 3				2.40	*X*
Total				7.27	

Appendix B

Mount View Offset Area –
Koala MHQA scoring (Baseline)
GHFF FHA scoring (Baseline)

MVOA – AU1 (Koala baseline) MHQA

Assessment Unit - Regional Ecosystem	AU 1 - Regrowth (RE12.3.3)				
	RE12.3.3 Benchmark	Transect 2	Average of Transect(s)	% Benchmark	Score
SITE CONDITION					
Recruitment of woody perennial species in EDL	100	20	20	20	3
Native plant species richness - trees	5	12	12	240.00	5
Native plant species richness - shrubs	5	1	1	20.00	0
Native plant species richness - grasses	9	2	2	22.22	0
Native plant species richness - forbs	25	1	1	4.00	0
Tree canopy height (Canopy)*	25	18	18	72.00	5
Tree canopy height (Sub-canopy)*	9	8	8	88.89	5
				*Average tree canopy height	5
Tree canopy cover (Canopy)**	40	15.6	15.6	39.00	2
Tree canopy cover (Sub-canopy)**	8	10.2	10.2	127.50	5
				**Average tree canopy cover	5
Shrub canopy cover	4	0	0	0.00	0
Native grass cover*	52	67	67	128.85	5
Organic litter*	20	3	3	15.00	3
Large trees (euc plus non-euc) (per ha)	14	2	2	14.29	5
Coarse woody debris (per ha)	588	95	95	16.16	2
Non-native plant cover	0	8	8	8.00	5
Quality and availability of food and foraging habitat	NA	NA	5	-	5
Quality and availability of shelter	NA	NA	5	-	5
				Site Condition Score (/100)	50.5
				Overall Site Condition Score - out of 3	1.52
SITE CONTEXT					
Size of patch	10				10
Connectedness	5				5

Context	5				5
Ecological Corridors	6				0
Role of site location to species overall population in the state	5				5
Threats to the species	15				7
Species mobility capacity	10				10
				Site Context Score (/56)	42
				Overall Site Context Score - out of 3	2.25
SPECIES STOCKING RATE					
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70				15
				Species Stocking Rate Score (/70)	15.00
				Overall Species Stocking Rate Score - out of 4	0.86
Overall Assessment Unit Score					4.62

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	5/15
Approximate density (per ha)	0/30
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	15/70
Species Stocking Rate Score – out of 4	**0.86**

*SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

MVOA – AU2 (Koala baseline) MHQA

Assessment Unit - Regional Ecosystem	AU 2 - Regrowth (RE12.8.17)				
	RE12.8.17 Benchmark	Transect 5	Average of Transect(s)	% Benchmark	Score
SITE CONDITION					
Recruitment of woody perennial species in EDL	100	33	33	33	3
Native plant species richness - trees	7	6	6	85.71	2.5
Native plant species richness - shrubs	5	3	3	60.00	2.5
Native plant species richness - grasses	12	3	3	25.00	2.5
Native plant species richness - forbs	27	9	9	33.33	2.5
Tree canopy height (Canopy)*	19	18	18	94.74	5
Tree canopy height (Sub-canopy)*	10	8	8	80.00	5
				*Average tree canopy height	5
Tree canopy cover (Canopy)**	48	23.1	23.1	48.13	2
Tree canopy cover (Sub-canopy)**	20	14.8	14.8	74.00	5
				**Average tree canopy cover	3.5
Shrub canopy cover	5	0	0	0.00	0
Native grass cover*	32	54	54	168.75	5
Organic litter*	21	5	5	23.81	3
Large trees (euc plus non-euc) (per ha)	24	10	10	41.67	5
Coarse woody debris (per ha)	234	15	15	6.41	0
Non-native plant cover	0	10	10	10.00	5
Quality and availability of food and foraging habitat	NA	NA	5	-	5
Quality and availability of shelter	NA	NA	5	-	5
				Site Condition Score (/100)	49.5
				Overall Site Condition Score - out of 3	1.49
SITE CONTEXT					
Size of patch	10				10
Connectedness	5				5

Context	5			5
Ecological Corridors	6			0
Role of site location to species overall population in the state	5			5
Threats to the species	15			7
Species mobility capacity	10			10
			Site Context Score (/56)	42
			Overall Site Context Score - out of 3	2.25
SPECIES STOCKING RATE				
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70			15
			Species Stocking Rate Score (/70)	15.00
			Overall Species Stocking Rate Score - out of 4	0.86
Overall Assessment Unit Score				4.59

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	5/15
Approximate density (per ha)	0/30
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	15/70
0.86	**2.29**

*SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

MVOA – AU3 (Koala baseline) MHQA

Assessment Unit - Regional Ecosystem	AU 3 - Cleared Paddocks					
	RE12.8.17 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	7	1	2	1.5	21.43	0
Native plant species richness - shrubs	5	1	2	1.5	30.00	2.5
Native plant species richness - grasses	12	2	2	2	16.67	0
Native plant species richness - forbs	27	1	2	1.5	5.56	0
Tree canopy height (Canopy)*	19	9	15	12	63.16	3
Tree canopy height (Sub-canopy)*	10	0	0	0	0.00	0
					*Average tree canopy height	1.5
Tree canopy cover (Canopy)**	48	0	0	0	0.00	0
Tree canopy cover (Sub-canopy)**	20	0	0	0	0.00	0
					**Average tree canopy cover	0
Shrub canopy cover	5	0	0	0	0.00	0
Native grass cover*	32	96	77	86.5	270.31	5
Organic litter*	21	0	0	0	0.00	0
Large trees (euc plus non-euc) (per ha)	24	0	0	0	0.00	0
Coarse woody debris (per ha)	234	5	0	2.5	1.07	0
Non-native plant cover	0	7	45	26	26.00	3
Quality and availability of food and foraging habitat	NA	NA	NA	1	-	1
Quality and availability of shelter	NA	NA	NA	1	-	1
					Site Condition Score (/100)	19
					Overall Site Condition Score - out of 3	0.57
SITE CONTEXT						
Size of patch	10					10
Connectedness	5					5
Context	5					5

Ecological Corridors	6					0
Role of site location to species overall population in the state	5					5
Threats to the species	15					7
Species mobility capacity	10					10
					Site Context Score (/56)	42
					Overall Site Context Score - out of 3	2.25
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70					15
					Species Stocking Rate Score (/70)	15.00
					Overall Species Stocking Rate Score - out of 4	0.86
Overall Assessment Unit Score						3.68

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	5/15
Approximate density (per ha)	10/30
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	15/70
Species Stocking Rate Score – out of 4	**0.86**

*SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

MVOA – AU1 (GHFF baseline) FHA

Assessment Unit - Regional Ecosystem	AU 1 regrowth - RE12.3.3				
Site Reference	Transect 2	Transect 4	Average	AU Score	OUT OF
	Raw Data	Raw Data	Score		(X/X)
Vegetation Condition	10.0	10.0	10.00	10	20
Species Richness	3.0	2.0	2.50	5	20
Flower Score	0.500	0.813	0.6565	8	10
Timing of Biological Shortages	8.5	8.5	8.50	8.5	10
Quality of Foraging Habitat	1	2	1.50	5	20
Non-native Plant Cover	8.00	15.00	11.50	10	20
Site Condition Score				46.5	*X*
MAX Site Condition Score				*100*	*X*
Site Condition Score - out of 4				1.86	*X*
Size of patch	10	10	10	10	10
Connectedness	3	3	3	3	10
Context	6	6	6	6	10
Ecological Corridors	0	0	0	0	10
Role of site location to species overall population in the state	6	6	6	6	10
Threats to the species	5	5	5	5	10
Site Context Score				30	*X*
MAX Site Context Score				*60*	*X*
Site Context Score - out of 3				1.50	*X*
GHFF Foraging Tree Density - Recorded	7	7	7.00		
GHFF Foraging Tree Density - per hectare	35	35	35.00	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				4.56	

MVOA – AU2 (GHFF baseline) FHA

Assessment Unit - Regional Ecosystem	AU 2 regrowth - RE12.8.17			
Site Reference	Transect 5	Average	AU Score	OUT OF
	Raw Data	Score		(X/X)
Vegetation Condition	10.0	10.00	10	20
Species Richness	3.0	3.00	5	20
Flower Score	0.575	0.5750	8	10
Timing of Biological Shortages	10	10.00	10	10
Quality of Foraging Habitat	2	2.00	5	20
Non-native Plant Cover	10.00	10.00	10	20
Site Condition Score			48	*X*
MAX Site Condition Score			*100*	*X*
Site Condition Score - out of 4			1.92	*X*
Size of patch	10	10	10	10
Connectedness	3	3	3	10
Context	6	6	6	10
Ecological Corridors	0	0	0	10
Role of site location to species overall population in the state	6	6	6	10
Threats to the species	5	5	5	10
Site Context Score			30	*X*
MAX Site Context Score			*60*	*X*
Site Context Score - out of 3			1.50	*X*
GHFF Foraging Tree Density - Recorded	22	22.00		
GHFF Foraging Tree Density - per hectare	110	110.00	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			4.62	

MVOA – AU3 (GHFF baseline) FHA

Assessment Unit - Regional Ecosystem	AU 3 Cleared areas				
Site Reference	Transect 1	Transect 3	Average	AU Score	OUT OF
	Raw Data	Raw Data	Score		(X/X)
Vegetation Condition	5.0	5.0	5.00	5	20
Species Richness	0.0	0.0	0.00	0	20
Flower Score	0.000	0.000	0.0000	2	10
Timing of Biological Shortages	0	0	0.00	0	10
Quality of Foraging Habitat	0	0	0.00	0	20
Non-native Plant Cover	90.00	10.00	50.00	5	20
Site Condition Score				12	*X*
MAX Site Condition Score				*100*	*X*
Site Condition Score - out of 4				0.48	*X*
Size of patch	10	10	10	10	10
Connectedness	3	3	3	3	10
Context	6	6	6	6	10
Ecological Corridors	0	0	0	0	10
Role of site location to species overall population in the state	6	6	6	6	10
Threats to the species	5	5	5	5	10
Site Context Score				30	*X*
MAX Site Context Score				*60*	*X*
Site Context Score - out of 3				1.50	*X*
GHFF Foraging Tree Density - Recorded	0	0	0.00		
GHFF Foraging Tree Density - per hectare	0	0	0.00	2	10
Species Stocking Rate Score				*2*	*X*
MAX Species Stocking Rate Score				*10*	*X*
Species Stocking Rate Score - out of 3				0.60	*X*
Total				2.58	

Appendix C

Mount View Offset Area

Raw MHQA and SAT data

Raw Weed Cover data

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	T2	Job Number / Property	11826 - Mount View Offset Area

Part B - Site Data

Recorders	AR + HC	Date	15.09.2025

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		12.3.3	12

Site description and Location (including details of discrete polygons within the assessment unit)
E.crebra with E.tereticornis and Angophora Floribunda + C.intermedia on slopes of waterway. Some rainforest species present in understory. Historical disturbance seen in waterway with logging and cattle grazing

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	12			EDL / Dom / R
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow Leaved Ironbark	EDL/Dom
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	EDL/Dom
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood	
Scientific Name	*Angophora floribunda*	Common Name	Rough-barked Apple	EDL/Dom
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	EDL/Dom/R
Scientific Name	*Angophora subvelutina*	Common Name	Broad-leaved Apple	EDL/Dom
Scientific Name	*Mallotus philippensis*	Common Name	Red Kamala	
Scientific Name	*Lophostemon confertus*	Common Name	Brush Box	
Scientific Name	*Cryptocarya sp*	Common Name	Jackwood	
Scientific Name	*Acacia concurrens*	Common Name	Black Wattle	
Scientific Name	*Syzigium sp*	Common Name	Lilly Pilly	
Scientific Name	*Aphananthe philippinensis*	Common Name	Rough-leaved Elm	

Shrub species richness:			
Total number of species	1		
Scientific Name	*Acacia maidenii*	Common Name	Maidens Wattle
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Digitaria didactyla*	Common Name	Queenland Couch
Scientific Name	*Imperata cylindrica*	Common Name	Blady Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	1		
Scientific Name	*Maclura cochinchinensis*	Common Name	Cockspur Vine
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	8.00%		
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Balloon Cotton Bush
Scientific Name	*Sporobolus natalensis*	Common Name	Giant Rat's Tail Grass

Scientific Name	*Centella asiatica*	Common Name	Indian Pennywort
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name	*Asclepias curassavica*	Common Name	Red Topped Cotton Bush
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	95.00		
1	5.40	26	
2	4.10	27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	75%	85%	70%	80%	25%	67%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	0%	0%	0%	0%	
Native shrubs	0%	0%	0%	0%	0%	
Non-native grass	20%	10%	25%	0%	0%	11%
Non native forbs and shrubs	0%	5%	5%	20%	20%	10%
Litter	0%	0%	0%	0%	15%	3%
Rock	5%	0%	0%	0%	0%	1%
Bare Ground	0%	0%	0%	0%	40%	8%
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	540	Number of large eucalypt trees:	A.floribunda 850
Non- Eucalypt Large tree DBH benchmark used:	N/A	Number of large non eucalypt trees:	0
Total number of large trees recorded:	1		
Total Number Large Trees per ha:	2		

Median Tree Canopy Height Measurements	Canopy:	18	Sub-canopy:	8	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	20

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	15.6%	Sub-canopy:	10.20%	Emergent:	
Shrub canopy cover %	0.00%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	83.0	98.6	15.6	T2	56.1	60.1	4.0
T1			0.0	T2	72.1	78.3	6.2
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Corymbia tessellaris	2
Angophora subvelutina	1
Mallotus philippensis	1
Eucalyptus crebra	1
Jackwood	1
Lillly Pilly	1
Total	7
Total stems per hectare	35

Attach Landscape Photos Here

North





East



West



Habitat Quality Assessment Unit Score Sheet			

Part A - Administrative

Transect ID	T3	Job Number / Property	11826 - Mount View Offset Area

Part B - Site Data

Recorders	AR + HC	Date	15.09.2025

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		Non-remnant	12

Site description and Location (including details of discrete polygons within the assessment unit)
Cleared paddock on ridge line. Domianted by native grasses with common pasture weeds. Isolated paddock trees

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	1			EDL / Dom / R
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	EDL / Dom / R
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	1		
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Digitaria didactyla*	Common Name	Queensland Couch
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	1		
Scientific Name	*Whalenbergia queenslandica*	Common Name	Qld Buebell
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	7.00%		
Scientific Name	*Centella asiatica*	Common Name	Indian Pennywort
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Balloon Cotton Bush
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	5.00		
1	0.50	26	
2		27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	100%	95%	95%	95%	95%	96%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	0%	0%	0%	0%	
Native shrubs	0%	0%	0%	0%	0%	
Non-native grass	0%	0%	0%	0%	0%	
Non native forbs and shrubs	0%	5%	5%	5%	5%	4%
Litter	0%	0%	0%	0%	0%	
Rock	0%	0%	0%	0%	0%	
Bare Ground	0%	0%	0%	0%	0%	
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	0
Non- Eucalypt Large tree DBH benchmark used:	N/A	Number of large non eucalypt trees:	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	Canopy:	9	Sub-canopy:	absent	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	100.0%

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	0.0%	Sub-canopy:	0.00%	Emergent:	
Shrub canopy cover %	0.00%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
nil	
Total	0
Total stems per hectare	0

Attach Landscape Photos Here

North



South



East





West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	T5	Job Number / Property	11826 - Mount View Offset Area

Part B - Site Data

Recorders	LB + HC	Date	18.09.2025

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		12.8.17	12

Site description and Location (including details of discrete polygons within the assessment unit)
Steep eroded gully. Eucalyptus crebra and tereticornis dominnant. Cattle access throughout and lantana presence

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	6			EDL / Dom / R
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved ironbark	EDL / Dom
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	EDL / Dom
Scientific Name	*Angophora subvelutina*	Common Name	Broad-leaved apple	EDL / Don / R
Scientific Name	*Melaleuca bracteata*	Common Name	Black Tea Tree	
Scientific Name	*Allocasurina torulosa*	Common Name	Forest She-oak	
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	3		
Scientific Name	*Alectron tomentosa*	Common Name	Hairy Alectron
Scientific Name	*Allocasurina torulosa*	Common Name	Forest She-oak
Scientific Name	*Acacia salicina*	Common Name	Sally Wattle
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	3		
Scientific Name	*Imperata cylindrica*	Common Name	Blady grass
Scientific Name	*Heteropogon contortus*	Common Name	Black Speargrass
Scientific Name	*Digitaria didactyla*	Common Name	Queenland Couch
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	9		
Scientific Name	*Ficinia nodosa*	Common Name	Club Rush
Scientific Name	*Eustrephus latifolius*	Common Name	Wombat Berry
Scientific Name	*Pteridium esculentum*	Common Name	Bracken Fern
Scientific Name	*Xanthorrhoea johnsonii*	Common Name	Forest Grass Tree
Scientific Name	*Lemna disperma*	Common Name	Duckweed
Scientific Name	*Geranium solanderi*	Common Name	Native Geranium
Scientific Name	*Lygodium microphyllum*	Common Name	Climbing Maidenhair
Scientific Name	*Maclura cochinchinensis*	Common Name	Cockspur Vine
Scientific Name	*Oplismenus aemulus*	Common Name	Creeping Beard Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	10.00%		
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Baloon Cotton Bush
Scientific Name	*Onopordum acanthium*	Common Name	Scotch Thistle
Scientific Name	*Crotalaria beddomeana*	Common Name	Rattle Pod
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Bidens pilosa*	Common Name	Cobblers peg
Scientific Name	*Ageratum houstonianum*	Common Name	Blue Billy Goat Weed
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	15.00		
1	0.50	26	
2	1.00	27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	15%	55%	35%	100%	65%	54%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	5%	0%	0%	0%	1%
Native shrubs	0%	0%	0%	0%	0%	
Non-native grass	0%	0%	0%	0%	0%	
Non native forbs and shrubs	5%	0%	0%	0%	10%	3%
Litter	0%	10%	10%	0%	5%	5%
Rock	0%	20%	25%	0%	0%	9%
Bare Ground	80%	10%	30%	0%	20%	28%
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	E.tereticornis 520, 430, 560, 560. E.crebra 520
Non- Eucalypt Large tree DBH benchmark used:	N/A	Number of large non eucalypt trees:	
Total number of large trees recorded:	5		
Total Number Large Trees per ha:	10		

Median Tree Canopy Height Measurements	Canopy:	18	Sub-canopy:	8	Emergent:	

Percentage of ecologically dominant layer species regenerating:	33

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	23.1%	Sub-canopy:	14.80%	Emergent:	
Shrub canopy cover %	0.00%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	5.4	10.3	4.9	T2	0.0	3.5	3.5
T1	24.0	41.0	17.0	T2	52.1	53.1	1.0
T1	49.3	50.5	1.2	T2	86.7	97.0	10.3
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Shrub			0.0	**Shrub**			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Allocasurina torulosa	10
Eucalyptus crebra	5
Eucalyptus tereticornis	4
Acacia salicina	1
Angophora subvelutina	2
Total	22
Total stems per hectare	110

Attach Landscape Photos Here

North



South



East





West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	T6	Job Number / Property	11826 - Mount View Offset Area

Part B - Site Data

Recorders	LF + JP	Date	12.02.2026

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
na		Non-remnant	12

Site description and Location (including details of discrete polygons within the assessment unit)
Open Paddock with isolated trees - E.Crebra + C.Tesserlaris regrowth. Dominated by native Black Spear Grass + invasive Giant Rat's Tail Grass.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	2			EDL / Dom / R
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	EDL / Dom / R
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved ironbark	EDL / Dom / R
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	2		
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved ironbark
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Digitaria didactyla*	Common Name	Queensland Couch
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	2		
Scientific Name	*Cyperus difformis*	Common Name	Dirty Dora
Scientific Name	Dichondra repens	Common Name	Kidney weed
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	45.00%		
Scientific Name	*Onopordum acanthium*	**Common Name**	Scotch Thistle
Scientific Name	*Gomphocarpus physocarpus*	**Common Name**	Balloon Cotton Bush
Scientific Name	*Sporobolus natalensis*	**Common Name**	Giant Rat's Tail Grass
Scientific Name	*Verbena bonariensis*	**Common Name**	Purpletop Vervain
Scientific Name	*Melinis repens*	**Common Name**	Red Natal Grass
Scientific Name	*Ageratum houstonianum*	**Common Name**	Blue billygoat weed
Scientific Name	*Bidens pilosa*	**Common Name**	Cobbler's pegs
Scientific Name	*Crassocephalum crepidioides*	**Common Name**	Thickhead
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	**0.00**		
1		**26**	
2		**27**	
3		**28**	
4		**29**	
5		**30**	
6		**31**	
7		**32**	
8		**33**	
9		**34**	
10		**35**	
11		**36**	
12		**37**	
13		**38**	
14		**39**	
15		**40**	
16		**41**	
17		**42**	
18		**43**	
19		**44**	
20		**45**	
21		**46**	
22		**47**	
23		**48**	
24		**49**	
25		**50**	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	100%	93%	95%	90%	5%	77%
Native other grass	0%	0%	0%	0%	0%	
Native forbs and other species	0%	0%	0%	0%	0%	
Native shrubs	0%	0%	0%	0%	0%	
Non-native grass	0%	0%	0%	0%	0%	
Non native forbs and shrubs	0%	7%	5%	10%	95%	23%
Litter	0%	0%	0%	0%	0%	
Rock	0%	0%	0%	0%	0%	
Bare Ground	0%	0%	0%	0%	0%	
Cryptogram	0%	0%	0%	0%	0%	
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	**Number of large eucalypt trees:**	0
Non- Eucalypt Large tree DBH benchmark used:	N/A	**Number of large non eucalypt trees:**	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	**Canopy:**	15	**Sub-canopy:**	absent	**Emergent:**	NA

Percentage of ecologically dominant layer species regenerating:	**100.0%**

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	**Canopy:**	0.0%	**Sub-canopy:**	0.00%	**Emergent:**	
Shrub canopy cover %	0.00%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	**T2**			0.0

T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

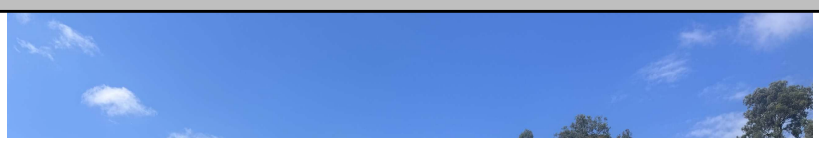
Species Name	Stem Count
nil	
Total	0
Total stems per hectare	0

Attach Landscape Photos Here

North



South





East



West



■ Report type

Spot Assessment Technique (SAT)				
Date:	15.09.2025	**Site: 11826**	**SAT ID: 1**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Angophora subveluntina*	Broad-leaved Apple	360	N
2	*Grevillia ribusta*	Silky Oak	670	N
3	*Mallotus philippensis*	Red Kamala	140	N
4	*Acacia concurrens*	Black Wattle	250	N
5	*Aphananthe philippinensis*	Rough-leaved Elm	390	N
6	*Harpulia pendula*	Tulipwood	450	N
7	*Harpulia pendula*	Tulipwood	250	N
8	*Harpulia pendula*	Tulipwood	482	N
9	*Harpulia pendula*	Tulipwood	400	N
10	*Harpulia pendula*	Tulipwood	380	N
11	*Grevillia ribusta*	Silky Oak	510	N
12	*Harpulia pendula*	Tulipwood	470	N
13	*Grevillia ribusta*	Silky Oak	510	N
14	*Harpulia pendula*	Tulipwood	420	N
15	*Harpulia pendula*	Tulipwood	240	N
16	*Glochidion sumatranum*	Long-leaved Cheese Tree	330	N
17	*Mallotus philippensis*	Red Kamala	130	N
18	*Harpulia pendula*	Tulipwood	950	N
19	*Mallotus philippensis*	Red Kamala	170	N
20	*Harpulia pendula*	Tulipwood	590	N
21	*Aphananthe philippinensis*	Rough-leaved Elm	170	N
22	*Harpulia pendula*	Tulipwood	420	N
23	*Harpulia pendula*	Tulipwood	470	N
24	*Harpulia pendula*	Tulipwood	390	N
25	*Harpulia pendula*	Tulipwood	250	N
26	*Harpulia pendula*	Tulipwood	240	N
27	*Harpulia pendula*	Tulipwood	410	N
28	*Harpulia pendula*	Tulipwood	340	N
29	*Harpulia pendula*	Tulipwood	230	N
30	*Harpulia pendula*	Tulipwood	260	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

■ Report type

Spot Assessment Technique (SAT)				
Date:	18.09.2025	**Site: 11826**	**SAT ID: 3**	
Tree No.	**Scientific Name**	**Common Name**	**DBH**	**Scats**
1	*Allocasurina torulosa*	Forest She-oak	160	N
2	*Allocasurina torulosa*	Forest She-oak	200	N
3	*Corymbia intermedia*	Pink Bloodwood	450	N
4	*Allocasurina torulosa*	Forest She-oak	200	N
5	*Angophora subvelutina*	Broad-leaved Apple	350	N
6	*Corymbia intermedia*	Pink Bloodwood	500	N
7	*Eucalyptus crebra*	Narrow-leaved Ironbark	210	N
8	*Eucalyptus tereticornis*	Forest Red Gum	380	N
9	*Eucalyptus tereticornis*	Forest Red Gum	600	N
10	*Eucalyptus tereticornis*	Forest Red Gum	260	N
11	*Eucalyptus tereticornis*	Forest Red Gum	560	N
12	*Eucalyptus crebra*	Narrow-leaved Ironbark	380	N
13	*Eucalyptus crebra*	Narrow-leaved Ironbark	360	N
14	*Eucalyptus crebra*	Narrow-leaved Ironbark	250	N
15	*Eucalyptus crebra*	Narrow-leaved Ironbark	290	N
16	*Eucalyptus crebra*	Narrow-leaved Ironbark	400	N
17	*Eucalyptus crebra*	Narrow-leaved Ironbark	420	N
18	*Eucalyptus crebra*	Narrow-leaved Ironbark	310	N
19	*Eucalyptus tereticornis*	Forest Red Gum	480	N
20	*Eucalyptus crebra*	Narrow-leaved Ironbark	400	N
21	*Allocasurina torulosa*	Forest She-oak	160	N
22	*Allocasurina torulosa*	Forest She-oak	230	N
23	*Allocasurina torulosa*	Forest She-oak	130	N
24	*Allocasurina torulosa*	Forest She-oak	220	N
25	*Allocasurina torulosa*	Forest She-oak	450	N
26	*Allocasurina torulosa*	Forest She-oak	330	N
27	*Allocasurina torulosa*	Forest She-oak	210	N
28	*Allocasurina torulosa*	Forest She-oak	350	N
29	*Allocasurina torulosa*	Forest She-oak	340	N
30	*Eucalyptus crebra*	Narrow-leaved Ironbark	300	N
		Total Scats	0	
		Percentage	0.00	
		East Coast (med-high) Activity Category	Low	

Transect 1 Date: 03/10/2025

Start	End	Distance (m)	Ground Cover	Species
0	3.4	3.4	Native Grass	*Cynodon dactylon (Common Couch)*
3.4	4.3	0.9	Exotic Grass	*Sporobolus pyramidalis (Giant Rat's Tail Grass)*
4.3	8.1	3.8	Native Grass	*Cynodon dactylon (Common Couch)*
8.1	8.8	0.7	Exotic Forb	*Senecio madagascariensis (Fireweed)*
8.8	10.2	1.4	Native Grass	*Cynodon dactylon (Common Couch)*
10.2	10.6	0.4	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
10.6	12.6	2	Native Grass	*Cynodon dactylon (Common Couch)*
12.6	13.4	0.8	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
13.4	14.3	0.9	Exotic Forb	*Onopordum acanthium (Scotch Thistle)* *Verbena bonariensis (Purple Top Verbena)*
14.3	15	0.7	Native Grass	*Cynodon dactylon (Common Couch)*
15	15.2	0.2	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
15.2	15.5	0.3	Native Grass	*Cynodon dactylon (Common Couch)*
15.5	18.8	3.3	Exotic Forb	*Senecio madagascariensis (Fireweed)* *Gomphocarpus physocarpus (Balloon Cotton Bush)* *Onopordum acanthium (Scotch Thistle)*
18.8	21.1	2.3	Native Grass	*Heteropogon contortus (Black Speargrass)*
21.1	21.9	0.8	Native Grass	*Cynodon dactylon (Common Couch)*
21.9	22.4	0.5	Exotic Forb	*Senecio madagascariensis (Fireweed)* *Gomphocarpus physocarpus (Balloon Cotton Bush)*
22.4	24	1.6	Native Grass	*Cynodon dactylon (Common Couch)*
24	24.9	0.9	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
24.9	28.1	3.2	Native Grass	*Cynodon dactylon (Common Couch)*
28.1	30	1.9	Exotic Forb	*Senecio madagascariensis (Fireweed)*
30	44.3	14.3	Exotic Forb	*Taraxacum officinale (Common Dandelion)* *Conyza sumatrensis (Tall Fleabane)* *Onopordum acanthium (Scotch Thistle)*
44.3	48.6	4.3	Exotic Forb	*Senecio madagascariensis (Fireweed)*
48.6	50	1.4	Native Grass	*Cynodon dactylon (Common Couch)*
50	56.2	6.2	Exotic Forb	*Senecio madagascariensis (Fireweed)*
56.2	58.8	2.6	Native Grass	*Cynodon dactylon (Common Couch)*
58.8	60	1.2	Exotic Forb	*Senecio madagascariensis (Fireweed)*
60	62.5	2.5	Native Grass	*Cynodon dactylon (Common Couch)*
62.5	63.3	0.8	Exotic Forb	*Senecio madagascariensis (Fireweed)*
63.3	68.4	5.1	Native Grass	*Cynodon dactylon (Common Couch)* *Heteropogon contortus (Black Speargrass)*
68.4	76.6	8.2	Native Grass	*Imperata cylindrica (Blady Grass)*
76.6	77.4	0.8	Exotic Forb	*Senecio madagascariensis (Fireweed)*
77.4	82.5	5.1	Native Grass	*Imperata cylindrica (Blady Grass)*
82.5	89.5	7	Native Grass	*Heteropogon contortus (Black Speargrass)*
89.5	99.5	10	Native Grass	*Heteropogon contortus (Black Speargrass)* *Cynodon dactylon (Common Couch)*
99.5	100	0.5	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*

Native	61%
WONS - Lantana	0%
WONS - Fireweed	20%
All weeds	39%
Litter	0%
Bare Ground	0%

North



South



East



West



Transect 2 Date: 03/10/2025

Start	End	Distance (m)	Ground Cover	Species
0	3.6	3.6	Native Grass	*Imperata cylindrica (Blady Grass)*
3.6	21	17.4	Exotic Shrub	*Lantana camara (Lantana)*
21	26.1	5.1	Native Grass	*Heteropogon contortus (Black Speargrass)* *Adiantum atroviride (Maiden hair Fern)*
26.1	34.7	8.6	Exotic Shrub	*Lantana camara (Lantana)*
34.7	40.3	5.6	Bare Ground	*Bare Ground*
40.3	48.3	8	Exotic Shrub	*Lantana camara (Lantana)*
48.3	50	1.7	Native Forb	*Lomandra longifolia (Many Flowered Mat Rush)*
50	70.2	20.2	Native Forb	*Lomandra longifolia (Many Flowered Mat Rush)* *Adiantum atroviride (Maiden hair Fern)*
70.2	77.5	7.3	Bare Ground	*Bare Ground*
77.5	78.4	0.9	Native Grass	*Imperata cylindrica (Blady Grass)*
78.4	80	1.6	Exotic Shrub	*Lantana camara (Lantana)*
80	82	2	Exotic Forb	*Onopordum acanthium (Scotch Thistle)*
82	87.2	5.2	Exotic Shrub	*Lantana camara (Lantana)*
87.2	88	0.8	Native Forb	*Adiantum atroviride (Maiden hair Fern*
88	89.9	1.9	Exotic Shrub	*Lantana camara (Lantana)*
89.9	93.8	3.9	Bare Ground	*Bare Ground*
93.8	100	6.2	Exotic Shrub	*Lantana camara (Lantana)*

Native	32%
WONS - Lantana	49%
WONS - Fireweed	0%
All weeds	51%
Litter	0%
Bare Ground	17%

North



South



East



West



Transect 3 Date: 03/10/2025

Start	End	Distance (m)	Ground Cover	Species
0	22.3	22.3	Native Grass/forb	*Heteropogon contortus (Black Speargrass)* *Chrysocephalum apiculatum (Yellow Buttons)*
22.3	25.1	2.8	Exotic Forb	*Senecio madagascariensis (Fireweed)*
25.1	29	3.9	Native Grass	*Heteropogon contortus (Black Speargrass)*
29	29.2	0.2	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
29.2	31.2	2	Native Grass	*Heteropogon contortus (Black Speargrass)*
31.2	47.5	16.3	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)* *Verbena bonariensis (Purple Top Verbena)*
47.5	49.1	1.6	Native Grass	*Heteropogon contortus (Black Speargrass)*
49.1	50	0.9	Exotic Shrub	*Lantana camara (lantana)*
50	51.7	1.7	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
51.7	62.4	10.7	Native Grass/forb	*Heteropogon contortus (Black Speargrass)* *Chrysocephalum apiculatum (Yellow Buttons)*
62.4	66.2	3.8	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
66.2	66.6	0.4	Native Grass	*Heteropogon contortus (Black Speargrass)*
66.6	67.2	0.6	Exotic Forb	*Senecio madagascariensis (Fireweed)*
67.2	69.2	2	Native Grass	*Heteropogon contortus (Black Speargrass)*
69.2	69.6	0.4	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
69.6	71.2	1.6	Native Grass	*Heteropogon contortus (Black Speargrass)*
71.2	72.4	1.2	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
72.4	75.8	3.4	Native Grass	*Heteropogon contortus (Black Speargrass)*
75.8	77.9	2.1	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
77.9	78.5	0.6	Native Grass	*Heteropogon contortus (Black Speargrass)*
78.5	79	0.5	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
79	85.1	6.1	Native Grass	*Heteropogon contortus (Black Speargrass)*
85.1	85.2	0.1	Exotic Forb	*Gomphocarpus physocarpus (Balloon Cotton Bush)*
85.2	100	14.8	Native Grass	*Heteropogon contortus (Black Speargrass)*

Native	69%
WONS - Lantana	1%
WONS - Fireweed	3%
All weeds	31%
Litter	0%
Bare Ground	0%

North



South



East



West



Appendix D

Offset Assessment Guide Calculator results

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	Koala
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	4.43	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	Yes				Count	
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

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**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					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	4.43	Adjusted hectares	AUI (regrowth 12.3.3)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.2	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	9.68%	No		
									Future area without offset (adjusted hectares)	3.2	**Future area with offset (adjusted hectares)**	3.2				0.43				
					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)**	**7**	2.00	85%	1.70	1.34				
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	Yes		Count										0		0.00	0.00	#DIV/0!	#DIV/0!		
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

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	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Condition of habitat	0				$0.00		$0.00
Area of habitat	4.428	0.43	9.68%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#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	Koala
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	4.43	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	Yes				Count	
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	52				

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**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					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	4.43	Adjusted hectares	AU2 (regrowth 12.8.17)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	1.2	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	1.2	**Future area with offset (adjusted hectares)**	1.2	0.00	90%	0.00	0.00	0.16	3.63%	No	
					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)**	**7**	2.00	85%	1.70	1.34				
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	Yes		Count										0		0.00	0.00	#DIV/0!	#DIV/0!		
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

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	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Condition of habitat	0				$0.00		$0.00
Area of habitat	4.428	0.16	3.63%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#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	Koala
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	**1.2%**

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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	4.43	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	Yes				Count	
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

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**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					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	4.43	Adjusted hectares	AU3 (cleared)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	20.6	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	93.45%	Yes		
									Future area without offset (adjusted hectares)	20.6	**Future area with offset (adjusted hectares)**	20.6				4.14				
					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	85%	2.55	2.01				
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	Yes		Count										0		0.00	0.00	#DIV/0!	#DIV/0!		
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

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	#DIV/0!	**#DIV/0!**	$0.00	#DIV/0!	#DIV/0!
Condition of habitat	0				$0.00		$0.00
Area of habitat	4.428	4.14	93.45%	**Yes**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Summary

AU1	AU2	AU3	**Total**
9.68%	3.63%	93.45%	**106.76%**

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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**7**	Scale 0-10	
			Total quantum of impact	5.17	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

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**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					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	5.17	Adjusted hectares	AUI (regrowth 12.3.3)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.2	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	90%	0.00	0.00	0.78	15.18%	No	
									Future area without offset (adjusted hectares)	3.2	**Future area with offset (adjusted hectares)**	3.2								
					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	85%	2.55	2.45				
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

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	5.166	0.78	15.18%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**7**	Scale 0-10	
			Total quantum of impact	5.17	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

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** **Future area without offset (adjusted hectares)**	0.0	**Risk of loss (%) with offset** **Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale 0-10)**		**Future quality without offset (scale 0-10)**		**Future quality with offset (scale 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	5.17	Adjusted hectares	AU2 (regrowth 12.8.17)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	1.2	**Risk of loss (%) without offset** **Future area without offset (adjusted hectares)**	0% 1.2	**Risk of loss (%) with offset** **Future area with offset (adjusted hectares)**	0% 1.2	0.00	90%	0.00	0.00	0.29	5.69%	No	
					Time until ecological benefit	20	**Start quality (scale 0-10)**	**5**	**Future quality without offset (scale 0-10)**	**5**	**Future quality with offset (scale 0-10)**	**8**	3.00	85%	2.55	2.45				
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

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	5.166	0.29	5.69%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#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

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	Habitat	**Area**	7.38	Hectares	
			Quality	**7**	Scale 0-10	
			Total quantum of impact	5.17	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

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** **Future area without offset (adjusted hectares)**	0.0	**Risk of loss (%) with offset** **Future area with offset (adjusted hectares)**	0.0								
					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	5.17	Adjusted hectares	AU3 (cleared)	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	20.6	**Risk of loss (%) without offset** **Future area without offset (adjusted hectares)**	0% 20.6	**Risk of loss (%) with offset** **Future area with offset (adjusted hectares)**	0% 20.6	0.00	90%	0.00	0.00	5.94	114.94%	Yes	
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**7**	4.00	75%	3.00	2.88				
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

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	5.166	5.94	114.94%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Summary

AU1	AU2	AU3	Total
15.18%	5.69%	114.94%	**135.81%**

Appendix E

Risk Assessment

Risk Assessment for Mount View Offset Area

A qualitative risk assessment which considers the risks of achieving the objectives and outcomes for the MVOA 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 and/or The Proponent 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 MVOA, 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 not traversed inland SEQ for at least the last 20 years, with the exception of Cyclone Debbie in 2017. 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 the MVOA location, nor proximal to the MMVOA. 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 generation[1].

[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/

Risk framework

		Consequence				
		Minor	Moderate	High	Major	Critical
Likelihood	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 MVOA. Legislative reform prejudices proposed tenure arrangements for offset properties.	Management action 1: • Legally secure the MVOA via a suitable method including a voluntary declaration under the *Vegetation Management Act 1999* • A covenant will be completed under either Chapter 6 Part 4 Division 8A of the Land Act 1994 (Qld) or Part 6 Division 4A of the Land Titles Act 1994 (Qld). • If a covenant is not possible an alternative legally binding mechanism will be implemented in consultation with DCCEEW.	R	Mod	Low	Clearing of the 7.52 ha impact area cannot occur without legally securing the MVOA. Covenant or alternative mechanism to be completed within 12 months of commencing the action.	N/A
Pest management	Failure to reduce the threat of introduced non-native invertebrate 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).	• Should the introduced predator control measures not result in a maintenance of low introduced predator numbers (compared to baseline survey), introduced predator program to be expanded/adapted to improve outcomes. • 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

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		
							suitably qualified and experienced wildlife carer.
WONS management	Failure to control WONS.	Management Action 3: • Develop and implement a weed strategy, with a particular focus on weeds listed with particularly ability to impact on movement and structural vegetation composition (predominantly *Lantana camara and* Fireweed), and under the *Biosecurity Act 2014*, to reduce weed cover to target thresholds. • Undertake weed management in accordance with the OMP.	U	Mod	Low	Annual (photo monitoring and mapping of weed infestations) and 5-year Targeted transects and MHQA) surveys of non-native plant cover to ensure reduction across MVOA. Surveys in-line with weed management strategy. Repeated surveys of baseline data including 5 yearly habitat monitoring data as part of the framework.	If weed survey indicates weed cover is not reduced since previous survey, weed control program to be expanded/ adapted to improve outcomes.
High intensity fire	A high intensity uncontrolled fire occurs within the MVOA 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 MVOA, 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. • Monitoring to occur 3-6 months post event or after

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		
							the next wet weather event (whichever is sooner). • Where natural regeneration is failing to thrive, assist natural regeneration through direct seeding and planting
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 MVOA 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 MVOA 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.	• infill planting/ revegetation to be implemented after sufficient rest period.

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		
	Failure to increase habitat for offset species.	Management Action 1: • legally secure MVOA and remove incompatible land uses. Management Action 3: • Reduce the extent of weed as per criteria; and • Implement infill planting if 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 AOMP.	If MHQA transects indicate habitat less than performance indicators, implement infill planting in weed control areas. Should plant stock fail supplementary planting, direct seeding, weed control, fertiliser, amelioration or other management actions necessary to stimulate tree growth.
	If infill planting is required and there is high plant stock failure.	Management Action 3: • Adhere to planting method and watering schedule.	U	Mod	Low	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.

Appendix F

Rehabilitation Plan

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan

DWG NO.	DRAWING TITLE	ISSUE	DATE
11826 E 01 DRP C	COVER SHEET	C	17/02/2026
11826 E 02 DRP C	INTRODUCTION AND NOTES	C	17/02/2026
11826 E 03 DRP C	REHABILITATION ZONES	C	17/02/2026
11826 E 04 DRP C	PLANTING SPECIES SCHEDULE	C	17/02/2026
11826 E 05 DRP C	WEED NOTES	C	17/02/2026
11826 E 06 DRP C	PLANTING NOTES	C	17/02/2026
11826 E 07 DRP C	MAINTENANCE AND MONITORING	C	17/02/2026
11826 E A01-A03 DRP C	APPENDIX A: WEED TREATMENT AND REMOVAL	C	17/02/2026



Saunders Havill

PATHWAYS TO SUCCESS

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - *Introduction and Notes*

INTRODUCTION

This Rehabilitation Plan (RP) has been prepared by **Saunders Havill (SH)** for **HB Qld Pty Ltd** for the Mount View Offset Area associated with works at Residential Development, Ripley Residential Development Project 187-197 Binnies Road, Ripley, QLD, 4306 (EPBC 2024/09865).

The primary objective of this DRP is to provide a practical guide for the recreation of resilient, fully-functioning vegetation communities that achieve the Environmental Outcomes proposed under the Offset Management Plan.

This DRP is to function as a guide and reference document for the proposed rehabilitation techniques and planting palettes proposed for the EPBC 2024/09865 offset area.

BACKGROUND

A substantial amount of rehabilitation research has been conducted and compiled as part of the "South East Queensland Ecological Restoration Framework (SEQERF)" and subsequently endorsed by the majority of South East Queensland councils. Given this, information provided within this RP will largely utilize information derived from this framework.

Rehabilitation or "Ecological Restoration" can be described as "the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed" (source: Society for Ecological Restoration International).

The ability of an ecosystem to recover naturally depends on the existing natural regeneration capacity of the ecosystem i.e. resilience potential, and the level and type of disturbance, degradation or damage that has occurred. Generally, the ability of an ecosystem to naturally recover declines with increased disturbance, degradation or damage.

Determination of the resilience potential and level of degradation will assist practitioners to determine the level of effort required to restore the ecosystem. The following four ecological restoration approaches are listed under the SEQERF guidelines and are described in further detail on *Sheet 03*.

- Natural Regeneration
- Assisted Natural Regeneration
- Reconstruction
- Fabrication

In practice, sites with higher resilience potential should adopt the Natural Regeneration and Assisted Natural Regeneration approaches as these are generally the most cost-effective and encourage recruitment of locally occurring species that are adapted to local conditions. Adversely, highly degraded sites with poor resilience and an exhausted soil seed bank will likely require Reconstruction or Fabrication approaches i.e. planting to restore the ecosystem.

A key aspect of ecological restoration is that structure and function are returned to site, improving site stability, and improved habitat for fauna and flora. Structure includes vegetation height and density, canopy cover and appropriate species, as well as habitat features such as fallen logs and site rock. Function refers to the natural and self-sustaining processes occurring within the site including regeneration capacity, succession and cycling of nutrients. Activities required to achieve these objectives may include controlling environmental weeds, re-establishment of wildlife corridors and or stabilisation of creek banks.

As restoration work progresses on a site, ongoing changes to the structure and diversity of the vegetation will become apparent. These changes tend to occur in a cyclical manner, with the initial disturbance to the vegetation (either natural or man-made) being the trigger for changes. It is important to recognize that the vegetation will have to pass through a variety of stages of succession first, often over a period of years.

While disturbance as part of restoration works often has a negative connotation, it can also be useful for site restoration. Regeneration of native plant species is stimulated by mimicking natural disturbances. The techniques used will depend on the individual species and vegetation community, as they have evolved to respond to disturbances in different ways. Some examples of these techniques are:

- Control of competing vegetation, especially environmental weeds;
- Controlled burns or burn piles in vegetation communities adapted to fire;
- Soil disturbances such as ripping or raking; and or
- Alterations to hydrology in wetlands to reinstate natural movement.

The SEQERF also highlights that consistent follow up is critical for success of ecological restoration. This ensures that beneficial, permanent changes can occur within the vegetation community benefiting both fauna and flora. In order to be able to confirm these changes are occurring, ongoing site monitoring may also be required.

Ecological restoration is a complicated and evolving field. It requires careful consideration for all ecosystem aspects to try and minimise any unexpected interactions, although is generally accepted that not all can be fully known about each complex ecosystem. Given this, it is necessary to remain flexible throughout this process to adapt to site and natural changes.

REHABILITATION - APPROACHES

Ecological Restoration Approaches	
Assisted Natural Regeneration	
Applies:	To natural areas where the native plant community is largely healthy and functioning. When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water. Where the natural regeneration processes (seedling germination, root suckering, etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing, etc. When limited human intervention, such as weed control, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration. When the main management issue is weed infestation and/or current land use practices.
Role of planting:	Planting in such areas can work against the aims of restoration by interfering with natural regeneration except where species cannot return to site without direct intervention.
Goal vegetation community:	The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation.
Reconstruction	
Applies:	Where the site is highly degraded or altered. When the degree of disturbance has been so great and long-standing that the pre-existing native plant community cannot recover by natural means. To sites such as areas of fill, sites affected by stormwater flow, areas that have been drastically cleared, even though there may be a few remaining native trees or shrubs. When a greater degree of human intervention is required, such as weed control, cessation of grazing and/or slashing, amelioration of soil conditions such as importation of soils, drainage works or re-shaping of the landscape.
Role of planting:	Importation of native species to the area is required, either through planting or direct seeding (in some situations). natural regeneration and recruitment is insufficient to initially re-establish the original vegetation. Depending on the prevailing circumstances, the planting of a broad diversity of species from the target ecosystem may be unnecessary and the use of pioneers may be sufficient to re-establish ecological processes.
Goal vegetation community:	The re-establishing planted community should be similar to the original vegetation in structure, composition and diversity.

Note: Table adapted from Gold Coast City Council's 'Guideline for the preparation of a Rehabilitation Plan'

REHABILITATION - METHODOLOGY

Detailed assessment of site conditions prior to commencement of documentation is essential. As part of most rehabilitation scopes, it is worth considering an appropriate methodology for both compiling documentation and site works. This can be broken down into the following items:

- Site assessment
- Rehabilitation Design Documentation (this plan)
- Site Works
- Maintenance and monitoring

METHODOLOGY – SITE ASSESSMENT

Detailed assessment of site conditions prior to commencement of documentation is essential in the establishment of a site-specific ecological restoration methodology. In accordance with the SEQERF. The following checklist will form part of the site assessment process:

- Describe the history and background of the site
- Describe the soil, drainage, topography and aspect
- Describe the native vegetation on the site and along site boundaries
- Describe the weeds on site
- Describe the vegetation dispersal and structure
- Describe the fauna use onsite
- Describe estimated native regeneration response.

The responses to the above checklist will provide the basis of the proposed restoration approach from Natural Regeneration to Fabrication for each treatment area within this Rehabilitation Plan.

Consideration should be made in the importance of integrating site-specific measures for fauna habitat and movement. With many fauna species having specific habitat requirements, foraging patterns and movement patterns. During the site assessment process, the following provisions should be taken into consideration:

- Fauna movement opportunities via easements, tracts, utility corridors and or infrastructure pathways;
- Diversity and type of fauna and distribution on site;
- Habitat opportunities e.g. Dense foliage, roosting areas, log hollows and potential nesting boxes;
- Fauna disturbance and vicinity of works to significant nesting areas and or fauna movement;
- Distribution of significant specialized food resources e.g. Koala trees; and
- Stage weed removal and or altering of weed control technique if the weeds are currently forming a significant fauna habitat.

For the sake of keeping this plan concise, site analysis results are compiled under a separate template, and may or may not be included in this set, however the analysis outcomes derive the Rehabilitation design methodology.

METHODOLOGY – REHABILITATION DESIGN

This documentation has been compiled through processes outlined in the SEQERF, site analysis and previous rehabilitation project experiences. The rehabilitation design—comprising distinct management zones—provides assessment managers, clients and contractors a clear methodology to assist the recovery of an ecosystem(s) that has been degraded, damaged or destroyed. Rehabilitation zones were identified through detailed site analysis and are described on *Sheet 03*.

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References:
South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	16/12/2025	CLIENT DRAFT	LS	SM
B	16/02/2026	AMENDMENTS	LS	SM
C	17/02/2026	AMENDMENTS	LS	SM

CLIENT
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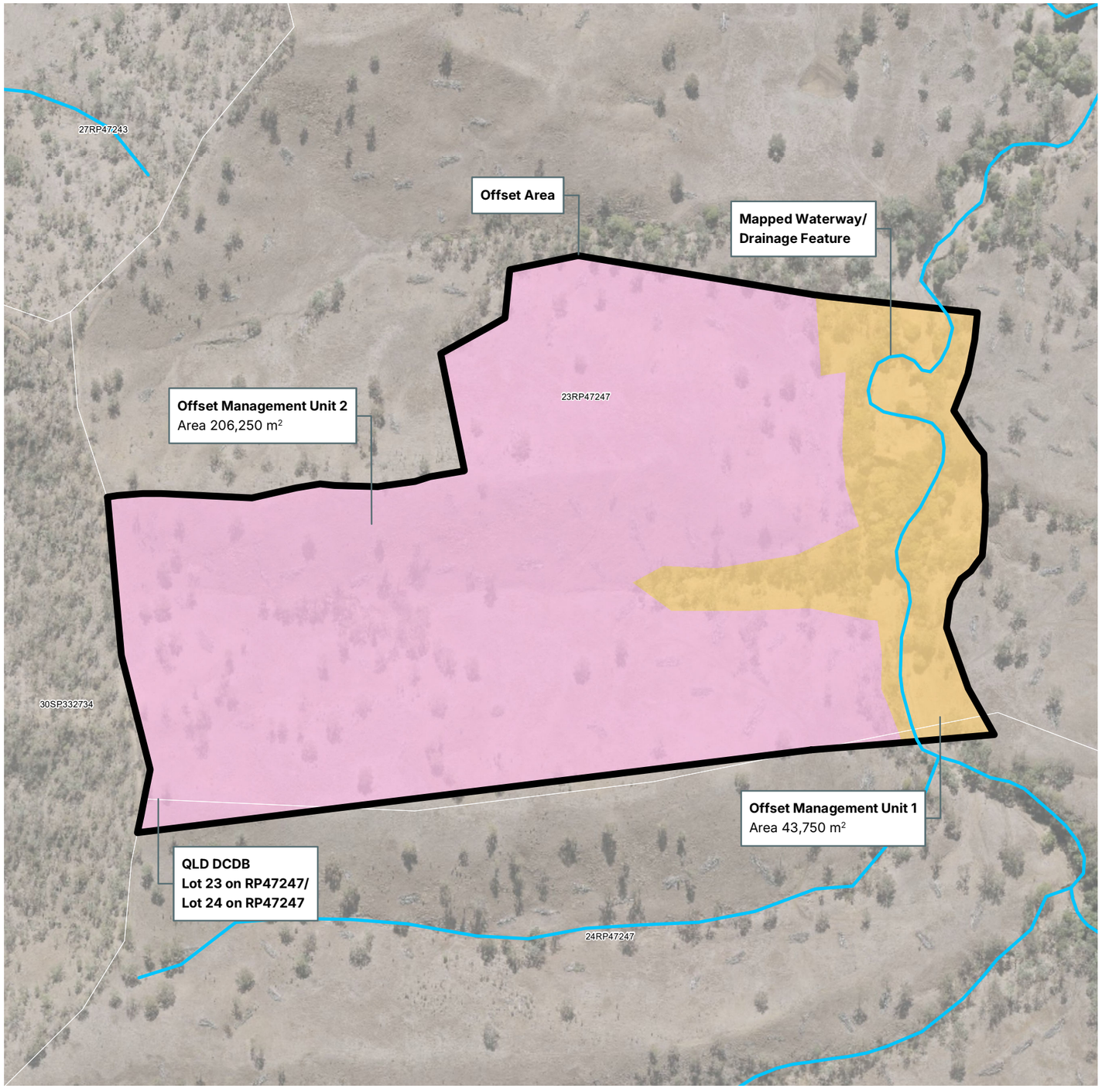
PROJECT
BINNIES ROAD
RIPLEY

DRAWING TITLE
DETAILED
REHABILITATION PLAN

DRAWING NO.
11826 E 02 DRP C

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - *Rehabilitation Zones*



MANAGEMENT ZONES LEGEND

Offset Management Unit 1 – Remnant and Regrowth Vegetation RE 12.8.7 and RE 12.3.3 Assisted Natural Regeneration

Existing native trees, shrubs and groundcovers to be protected and retained. RE12.8.17 and RE12.3.3 vegetation communities include similar tress species within the canopy and therefore should be subjected to the same management actions.

Appropriate (sensitive) weed management methodology within this zone to encourage natural regeneration, minimise damage to existing native vegetation and stabilise soil.

Infill planting where existing open areas are present, or where weed removal results in cleared open areas. Where required, and as guided by the regeneration contractor, trees shrubs and ground covers will be planted at a density not exceeding 1:10m^2, 1:5m^2 and 1:1m^2 respectively. The ultimate density is driven by on-ground features/ existing vegetation and guided by a regeneration contractor.

Refer to Rehabilitation Notes for additional details, plant species and densities.

Offset Management Unit 2 – Non-remnant Vegetation, RE 12.8.17 Reconstruction

Primary weed management in accordance with Southeast Queensland Ecological Restoration Framework (SEQERF) to encourage natural regeneration, minimise damage to existing native vegetation, and stabilise soil.

Planting works within the first two years will focus primarily on trees to allow time for establishment. Systematic infill plating of shrubs and groundcovers will then be completed as necessary to achieve the environmental outcomes and interim targets proposed in the Offset Management Plan. In areas where no existing groundcovers are occurring, any bare, eroded or erosion-prone areas may require cultivation, topsoil and blanket mulched with 100mm thick aged forest mulch). Blanket mulch within areas prone to inundation to be secured with a natural fibre netting or substituted with a natural fibre matting in heavily eroded/inundated areas.

Tree species selected will focus on trees from RE 12.8.17 that are currently lacking from the site which will benefit both Koala and GHFF outcomes. Entire zone to be planted with a mixture of trees, shrubs and groundcovers at rates of 1:10m^2, 1:5m^2 and 1:1m^2 respectively or at densities to support foraging habitat offset species requirements.

Refer to Rehabilitation Notes for additional details, plant species and densities.

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N

SCALE (A3)
1:4,000

References:
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0 25 50 100 150 m

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	16/12/2025	CLIENT DRAFT	LS	SM
B	16/02/2026	AMENDMENTS	LS	SM
C	16/02/2026	AMENDMENTS	LS	SM

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PROJECT
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DETAILED
REHABILITATION PLAN

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Detailed Rehabilitation Plan - *Planting Species Schedule*

Planting Species Schedule					
SCIENTIFIC NAME	**COMMON NAME**	**SPECIES BENEFIT**	**PLANT FORM**	**RE 12.3.3**	**RE 12.8.17**
TREES					
Eucalyptus tereticornis	Forest Red Gum	Koala (L*) GHFF (F/I*)	T1	✓	✓
Eucalyptus melliodora	Yellow-box	Koala GHFF (F*)	T1		✓
Eucalyptus crebra	Narrow-leaved Iron Bark	Koala (L*) GHFF (F/I*)	T1	✓	✓
Eucalyptus moluccana	Gum-topped Box	Koala (L*) GHFF (F/I*)	T1	✓	
Angophora subvelutina	Broad-leaved Apple	Koala (A*) GHFF (F*)	T1	✓	✓
Angophora floribunda	Rough-barked Apple	Koala (A*) GHFF (F*)	T1		✓
Eucalyptus melanophloia	Silver-leaved Ironbark	Koala (L*) GHFF (F*)	T1	✓	✓
Corymbia intermedia	Pink Bloodwood	Koala (A*) GHFF (F/I*)	T1	✓	✓
Corymbia tessellaris	Moreton Bay Ash	Koala (A*) GHFF (F*)	T1	✓	✓
Corymbia clarksoniana	Clarkson's Bloodwood	Koala GHFF (F*)	T1		✓
Lophostemon suaveolens	Swamp Box	Koala GHFF (F*)	T2	✓	
Allocasuarina torulosa	Forest Sheoak		T2		✓
Alphitonia excelsa	Soap Tree		T2 / S1	✓	
Acacia fimbriata	Brisbane Wattle		T2 / S1		✓
Acacia disparrima	Hickory Wattle		T2 / S1	✓	
Acacia leiocalyx	Black Wattle		T2 /S1	✓	
SHRUBS					
Petalostigma pubescens	Quinine Bush		S1	✓	
Acacia salicina	Sally Wattle		S1	✓	
Jacksonia scoparia	Dogwood		S1	✓	✓
Hovea lorata	Purple Pea Bush		S1		
Persoonia sericea	Silky Geebung		S1	✓	

GROUND COVERS					
Cymbopogon refractus	Barbed-wire Grass		G	✓	✓
Aristida vagans	Threeawn aristida		G		✓
Aristida personata	Purple Wiregrass		G		✓
Bothriochloa decipiens	Pitted Bluegrass		G		✓
Themeda triandra	Kangaroo Grass		G	✓	✓
Heteropogon contortus	Black-spear Grass		G		✓
Eragrostis brownii	Browns Love Grass		G	✓	
Desmodium brachypodum	Large tick-foil		G		✓
Eremophila debilis	Winter Apple		G	✓	
Dichondra repens	Kidney Weed		G	✓	
Glycine tabacina	Variable Glycine		G	✓	
Gahnia aspera	Variable Saw Sedge		G		✓
Lomandra longifolia	Spiky-headed Mat-rush		G		✓
Lomandra multiflora subsp. multiflora	Multi-flowered Matrush		G	✓	

L Locally important Koala habitat trees – Koala (ANU 2021)*
A Ancillary Koala habitat trees – Koala (ANU 2021)*
F Foraging tree – GHFF (Department of Environmental and Climate Change NSW 2008)*
I Important/significant foraging tree – GHFF (Department of Environmental and Climate Change NSW 2008)*
L Locally important Koala habitat trees – Koala (ANU 2021)*

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References:
South East Queensland Ecological Restoration Framework (2012)

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CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD
RIPLEY

DRAWING TITLE
DETAILED
REHABILITATION PLAN

DRAWING NO.
11826 E 04 DRP C

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - *Weed Notes*

METHODOLOGY – 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. It also forms part of the preliminary work required for reconstruction and fabrication scopes.

Weed Management is to be undertaken in accordance with the SEQERF Primary, Follow-up and Maintenance works notes above. Weed management shall encompass all species declared at the commonwealth, state and local level, and any weeds that appear to be invasive at the site.

Critical skills for Weed Management include:

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

Knowledge of Relevant Legislation

It is expected contractors have a depth of knowledge of relevant legislation to complete site rehabilitation works. This includes invasive plant classifications and control obligations under the Queensland *Biosecurity Act 2014* and local Biosecurity Plans (Refer to adjacent schedules for classification of weeds under the Act).

Bush regenerators must also comply with the requirements of the *Workplace Health and Safety Act 2011* or, when working on Commonwealth lands, the Commonwealth's Occupational Health and Safety (Commonwealth Employment) Act 1991.

Contractors should also obtain all relevant permits required under State and Commonwealth legislation (e.g. *Nature Conservation Act 1992*, *Fisheries Act 1994, Vegetation Management Act 1999, Biosecurity Act 2014*). Contractors must also be aware of and adhere to cultural heritage protection obligations under the *Aboriginal Cultural Heritage Act 2003* and where chemicals are in use, the *Agricultural Chemicals Distribution Control Act 1966*.

In addition to the above, contractors should also be familiar with local government body requirements (e.g. Local Codes, Policies and Guidelines).

Plant Identification Skills

Both native and weed species should be identified prior to primary weed removal works and ongoing throughout the follow-up and maintenance periods. This is to maximise natural regeneration and reducing likelihood of accidental weed spraying to native vegetation. Regenerating species to be treated and maintained in a similar manner to newly planted revegetation tube stock. If contractor is unsure of species, advice should be sought by botanist, specialist contractor or confirmed with Queensland Herbarium. Refer to indicative Weed Treatment schedules derived from Queensland Herbarium for an indication of weed species and treatments.

Knowledge of Different Weed Management Techniques

A range of weed management techniques are available to combat a variety of weeds and scenarios. Refer to adjacent schedules and Appendix A for an indication of weed management techniques.

RESTRICTED MATTERS (*BIOSECURITY ACT 2014*)	
Category	**Description**
1	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. Includes red imported fire ants, electric ants, Asian honey bees, and certain animal diseases, aquatic diseases and pathogens.
2	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. includes certain noxious fish, weeds and pest animals
3	You must not distribute this restricted matter. It must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread into other areas. includes weeds, pest animals and noxious fish
4	You must not move this restricted matter to ensure that it does not spread into other areas of the state. includes specific weeds, pest animals and noxious fish
5	You must not possess or keep this restricted matter under your control. These pests have a high risk of negatively impacting on the environment. You may only keep this restricted matter under a permit of the *Biosecurity Act 2014* or another Act. includes weeds, pest animals and noxious fish
6	You must not feed this category of restricted matter. Feeding this restricted matter may cause their numbers to increase and negatively impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted. Includes invasive animals such as feral deer, foxes, rabbits and wild dogs and noxious fish such as carp, gambusia and tilapia.
7	If you have these noxious fish in your possession, you must kill the restricted matter and dispose of the carcass by burying the whole carcass in the ground above the high tide water mark or placing it in a waste disposal receptacle. Includes noxious fish such as carp, weather loach, climbing perch and gambusia

WEED MANAGEMENT TECHNIQUES	
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 (Ligustrum sinense), 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 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 ochna.
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.
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.
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. The method is used for species such as lantana (ratio of 1:9 of glyphosate:water). Splatter gun involves spraying strips at one to two metre 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.
Oil-hang	Vines such as mile-a-minute (Ipomoea cairica) which produce long stolons extending many metres along the surface of the ground, are suited to the roll-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 (Protasparagus plumosus). 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 may 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 should not be used in wet weather, adjacent to waterways or in areas where native trees and shrubs are located. The use should be restricted to situations where a weed is particularly difficult to control e.g. cherry guava and where other methods have been unsuccessful.
Stem Injection	Large woody weeds such as camphor laurel, coral trees (Erythrina spp, Privet Ligustrum spp) 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 the 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 frilling). 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 handheld container can leak, and generally spot spraying would be recommended. 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 brush cutters, chainsaws, slashers, shovels, pruners, saws, 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	May involve use of machinery (e.g. brush cutter, 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.

Note: Table adapted from a table in SEQERF

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BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - *Planting Notes*

METHODOLOGY – 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 DRP, and local government policies and Australian Standards.

Techniques are determined based on individual site conditions and will vary from bare seed, seed pods, drone seeding, seedling planting by ground machine, or spades/mattocks, or a combination of several techniques across the site.

Where cultivation has occurred, seedlings are planted into the prepared rip-lines. Seedlings should be planted in cultivated or uncultivated sites at a depth to make good contact with moist soil, and the soil then compressed around the seedling to remove any air pockets.

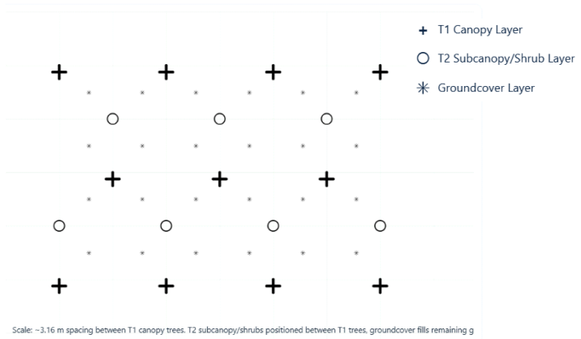
Planting should be of sufficient depth to ensure the entire root ball is buried with a minimum of five centimetres of natural ground covering the top of the root ball/potting mix. The stem of the seedling should be as vertical as possible.

Spreading bare seeds onto the top of the ground by hand or machine has a very low germination rate and requires high volumes of seed and good soil to seed contact to be successful. A high degree of pre-plant preparation is required before direct seeding is undertaken. Relatively flat open sites with little ground layer competition and sandy soils could be suitable for direct seeding by machine. Inaccessible sites with good pre-plant ground layer vegetation control could be suitable for drone dispersal.

Tube stock of native trees and shrubs should be planted into moist soil with good soil to seed contact at an optimum depth to maximise the seed germination. Seeds of the same species combined with various materials (e.g. clay) into a small pod shape can be used to reduce seed predation by insects, protect the seeds from adverse weather conditions, and increase germination. Inaccessible sites with good pre-plant ground layer vegetation control may be suitable for drone or manual dispersal of seed pods.

- **Weather events** such as dry weather conditions, extreme high temperatures, and extreme low temperatures will have a negative impact on seed germination and seedling survival.
- **Timing** must occur during seasons of high rainfall and mild temperatures.
- **Seedling types** must be a variety of local provenance genetics to ensure future resilience and ecological benefits. Multiple seedlings can be grown in a solid tray or individually in 50mm tube stock pots. Transplanting the tallest, most mature seedlings with solid mature root ball density maximises the survival and early growth rate of the seedlings.
- **Fertilising** seedlings is important just prior to planting. Alternately a liquid fertilizer can be added to the water when the seedlings are soaked on the day of planting. A complete, slow-release fertiliser is recommended, and is to 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.
- **Moisture** is a key element to reduce seedling transplant shock. The ground should have a full moisture profile, the seedlings should be soaked fully before planting, and there should be a high chance of rain after planting. Hand watering planted seedlings should be considered only as a last resort. Planting seedlings provides an opportunity to have the greatest control over forest design.
- **Maps**, including species combinations, will inform the planting contractors of the species mix for each planting site, the density and spacing of the seedlings and the specific location of each species mix across the site. Seedlings of the same species can be planted in small groups or spread randomly across the site.
- **Quality control** is undertaken at the time of planting. Clear instructions to planting contractor is required to ensure the planting quality standard is understood. This is usually best undertaken on the same day as contractor induction to make sure the planters understand the quality standards from day one. Any trees not planted correctly, or planted at the incorrect spacing, will need to be reworked at the contractor's cost. Further inspection of the planting work will be undertaken prior to completion of the planting work to ensure the standard and spacing requirements have been met. Invoices received from the planting contractor cannot be paid until the final inspection has been undertaken and any problems rectified. Work that does not meet the standard will need to be re-done as soon as possible at the expense of the contractor.

T2/shrub species are to be planted between T1 canopy tree rows. Groundcovers are to be dispersed evenly throughout the area.



Proposed planting arrangement for complete reconstruction (above)

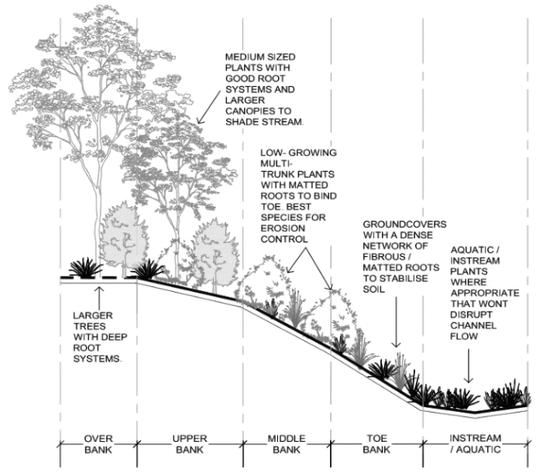


Figure 2: Categories of channel vegetation adapted from the Brisbane City Council Natural Channel Design Guidelines.

METHODOLOGY – POST PLANTING

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.

Rehabilitation and Planting Monitoring

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.

Photo Monitoring

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 during monitoring events, at the same location and (if possible) time of the year, before and after planting has commenced. If natural regeneration should fail, 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.

Annual Monitoring and Reporting

Rehabilitation progress reports will be prepared by the suitably qualified regeneration contractor and included in the MVOA Annual Report. A suitably qualified regeneration contractor will complete annual monitoring tasks until establishment of plantings is achieved (typically after five years).

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.

This will include:

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

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Detailed Rehabilitation Plan - *Maintenance and Monitoring*

METHODOLOGY – MAINTENANCE

By the maintenance stage, the vegetation community is at a point where native plant species are germinating and establishing. Weed density is starting to decrease as the native plants are able to out-compete the weeds. One of the fundamental principles of ecological restoration is that it attempts to create or re-establish an ecosystem that is self-sustaining. Therefore, it is the underlying goal that maintenance will eventually be decreased to a minimum. While this is not always possible, due to factors such as the continual reintroduction of weed propagules to the site from surrounding areas; unfavourable seasons or weather event; persistent weed species; or global influences such as the enhanced greenhouse effect, it should always be strived for (source: SEQERF). Maintenance works include watering, follow-up weed management, pest management and remedial planting as informed by adaptive management.

Watering regime – if required based on site conditions

Watering is a critical component during the establishment phase of ecological restoration where site conditions are unsuitable for plant growth. Watering regime is to be adjusted based on site conditions, species, and seasonal variability. Indicative intensive watering regime is as below.

Primary Establishment Phase (0–12 months)

- Frequency:
  - Weeks 1–4: Water every 2–3 days, especially in sandy or well-drained soils.
  - Weeks 5–12: Reduce to twice weekly, depending on rainfall and soil moisture.
  - Months 4–12: Weekly deep watering during dry spells.
- Volume:
  - Apply 10–20 litres per plant for trees and shrubs.
  - Groundcovers require less water, but will require full root zone saturation.
- Method:
  - Use drip irrigation, tree bags, or slow-release watering systems to minimise runoff and evaporation.
  - Avoid overhead watering to reduce disease risk.
- Seasonal Adjustments
  - Summer (Dec–Feb): Increase frequency due to high evapotranspiration.
  - Autumn/Winter (Mar–Aug): Reduce watering unless dry conditions persist.
  - Spring (Sep–Nov): Resume intensive watering as temperatures rise.
- Monitoring and Adaptation
  - Check soil moisture at root depth using probes or manual inspection.
  - Observe plant stress indicators: wilting, leaf drop, discoloration.
  - Adjust watering based on species needs.

Pest management

Non-native vertebrate pests will be managed as part of the broad management of the offset prescribed under the OAMP. Management will target non-native vertebrate predator and herbivore species which have potential to damage regenerating habitat areas. This includes wild dogs, European red foxes, feral cats, feral pigs and deer.

Weed control

Intensive weed control maintenance will be undertaken for at least two years after planting is completed, or until the planted seedlings are tall enough to access full sunlight and adequate soil moisture free from adjacent competing plants. Ongoing weed maintenance activities will be completed throughout the life of the offset with a focus on WONS. Care should be taken to ensure weed control approaches do not impact planted seedlings and herbicide application is used precisely and selectively to ensure no dieback to the plantings or developing understorey. Herbicide application must be undertaken by licensed and experienced contractors, and in accordance with registered label conditions and safety data sheet requirements at all times. Mechanical methods will be used where appropriate.

MONITORING AND REPORTING FRAMEWORK

Monitoring

Monitoring methods to track rehabilitation progress will comprise a mix of informal and formal monitoring methods to track progress against the proposed environmental outcomes for each MNES and objectives of this RMP. All monitoring will be undertaken by a suitably qualified Rehabilitation Contractor/Landscape consultant and/or Ecologist.

It is important for the long-term success of a habitat establishment project that both growth and survival are monitored at regular intervals. A monitoring program is proposed whereby the offset area is monitored annually using informal techniques (i.e., photo monitoring) and formal monitoring techniques at prescribed intervals under the MHQA method (i.e., years 5, 10, 15 and 20).

Informal

Informal or qualitative monitoring techniques will be employed as part of the offset monitoring. Informal monitoring methods are less time-consuming and technical and form an important tool for determining ecological restoration success. Informal monitoring will occur through site inspections at prescribed monitoring intervals and will include the following techniques:

1. Photo monitoring, and
2. Visual assessment.

Photo monitoring

Photo monitoring is a cost-effective and objective method to visually assess plant survival and growth. Photo monitoring can be used to build a consistent reference point for rehabilitation progress and provide a visual time series of the offset area from a baseline state to a self-sustaining state. Permanent photo points will be established in the first year of the offset commencement prior to any works commencing on-site (weed management or planting) using a star picket marked with fluorescent yellow safety cap or painted timber stakes. This will enable photos to be taken of the site at regular intervals as it is being restored. Photo point locations will be spread between EMZs at representative locations of each EMZ. Indicative photo monitoring locations will be established by the overseeing qualified Rehabilitation Contractor/Landscape Consultant and/or Ecologist. Photo monitoring will use the following method to ensure adequate data collection and consistency across monitoring events as recommended by the Guide to photo monitoring of ecological restoration projects (OEH, 2018):

- Each photo will include the established star picket demarcating the photo point location to create a fixed reference object in the field of view.
- Point the photo towards an established compass bearing (e.g. 55° North) for the photo point location.
- Take multiple photos (left, right, centre) allowing for each image to overlap to create a panoramic view. This will increase the coverage and representativeness of the scene/subject.
- Always take the photo from the same point, and at the same height.
- Use the same camera or the same type of camera each time the photo is taken.
- Minimise sun glare and shadow in the photo and try to take photos at the same time of day.
- Identify key species that will be visible in the photo.
- Take along copies of the original photos for reference when returning to the photo points to help match the field of view contents.

Visual assessment

At each photo monitoring location, a visual assessment will also be completed whereby general observations such as mortality rate, species, weed/WONS presence and other degrading factors are recorded.

Reporting

Following each photo monitoring event, a Photo Monitoring Report will be prepared which will include the following information:

- Photo set at each monitoring location.
- Commentary on mortality rate and presence of WONS/other weeds at a minimum with any additional relevant observations to inform adaptive management such as species-specific responses or herbivory.
- Adaptive management (if required).

Photo Monitoring Reports will be distributed to the rehabilitation contractor to instigate rectification works. After each monitoring event, photos will be transferred to a master photo monitoring data template, designed to show changes in each photo monitoring location between events.

Formal

Formal monitoring of rehabilitation works involves collecting quantitative data at prescribed monitoring intervals using a combination of monitoring methods and techniques. Formal monitoring provides data that cannot be measured by informal observations and can be easily compared against quantitative performance indicators. This will include:

MHQA Surveys

MHQA transects at 5-yearly intervals (5, 10, 15 and 20 years) following the commencement of the offset. Transects will be repeated at baseline locations before the end of the relevant monitoring interval (e.g. before the end of Year 5) and will be completed in accordance with the baseline survey methodologies described in the OAMP.

Reporting and Monitoring – Summary

The results of informal (photo monitoring and visual assessment) will be detailed in bi-annual monitoring reports and formal monitoring (MHQA surveys) in Milestone Survey Reports. Bi-annual monitoring reports will include a summary of estimated success rate (namely of tree species), any degrading factors at the site that may or are currently affecting survival success and any recommended adaptive management measures while Milestone Survey Reports will report on habitat quality improvements relative to the baseline survey condition and proposed Environmental Outcomes detailed in the OAMP.

The reporting schedule for the monitoring program is summarised in the table below.

Report	Purpose	Frequency	Responsible party
Milestone Survey Report *Details the results of MHQA, GHFF and FHA foraging habitat assessment.*	Designed to demonstrate increase in value of offset area for Matters of National Environmental Significance (koala and grey-headed flying-fox) as proposed under the OAMP.	Five-yearly at Years 5, 10, 15 and 20	Suitably qualified Ecologist as appointed by the Proponent
Photo Monitoring Report *Qualitative monitoring report showing photos of the offset area, commentary on rehabilitation progress and recommended adaptive management measures.*	Function is to provide regular assessment of the offset area and feedback to engaged rehabilitation contractors to guide on-ground works.	Bi-annually from Years 1 to 5 Years 10, 15 and 20	Suitably qualified Rehabilitation Contractor, Landscape Consultant or Ecologist as appointed by Offset Provider

ADAPTIVE MANAGEMENT

Adaptive management is a systematic approach for improving rehabilitation outcomes by learning from existing management techniques. It is a cyclic process that involves:

1. Identification of unsuccessful treatments and new threats during monitoring events
2. Investigation of new and alternative treatments
3. Implementation of new / alternative management strategies based on best available knowledge
4. Review of new / alternative management strategies during monitoring

Adopting an adaptive approach to rehabilitation works is recommended to maximise environmental outcomes for the site. Once an area is revegetated, the survival and growth of plants needs to be assessed, monitored and managed. Plans need to be adaptive in order to respond to identified issues on the site.

Multiple corrective action triggers for adaptive management are proposed. This includes:

- Native plant mortality >20% during the initial contractor establishment phase (3-5 years) of the plantings
- WONS cover >5% after Year 10
- Planting with groundcover species (grasses and forbs) if required to improve species richness targets as determined through MHQA monitoring. Indicative species palette is provided in this RMP.

A survival rate of 80% of tree species is proposed to be achieved for the offset area during the establishment phase of the plantings (3-5 years). This is required in order to achieve the proposed offset outcomes for the species under the OAMP. The 80% survival rate is to be achieved throughout the 3-5 year contractor establishment phase, after which the plantings are considered self-sustaining. It is anticipated the overall density of plantings will normalise to typical eucalypt forest density during the successional phase of the offset (5-20 years post planting). Where survival rates are observed to be less than 80% during the contractor establishment phase, this may indicate the presence of a degrading factor not previously identified or considered at the site and may require adaptive management measures to be considered and implemented. Degrading factors are to be identified as part of regular monitoring and will form the basis for actioning adaptive management.

Adaptive management measures may include a combination of the following:

- Identify and address the degrading factor (e.g. soil issue, species failure).
- Remedial plantings in areas of dieback to bolster survival rates to above 80% during the contractor establishment phase.
- Introduce a different species *i.e.,* if one plant species consistently dies on a site, consider using in its place a species that is performing well.
- Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques.
- Modify weed management techniques or frequency where WONS exceed 5% after Year 10.

REHABILITATION TEAM RESPONSIBILITIES

It is critical for all parties to understand their responsibilities within the rehabilitation 'team'.

PARTY	DESCRIPTION
Proponent	Ensure all consultants, contractors, sub-contractors or others utilising the area are aware of the Rehabilitation Management Plan. Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings. Provide security via an uncompleted works bond and maintenance bond for the cost of works if required. Cover costs of all resources to ensure works are completed as per approved plans.
Consultants	Brief proponent on their requirements in implementing and maintaining works as per the Rehabilitation Management Plan. Attend monitoring inspections. Undertake monitoring and reporting as per this plan. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Liaise with team throughout all stages of approval, initial works and maintenance of works.
Assessment Manager	Provide technical expertise via commentary on the approval of documentation. Attend monitoring inspections. Reduce and release securities held against works at the completion of successful milestone inspections. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Accept and review maintenance reports as dictated (if required)
Land Manager / Contractor	Ensuring implementation of works and compliance with this Rehabilitation Management Plan. Attend monitoring inspections. Has a minimum Certificate III in Conservation and Land Management, or a Certificate III in Horticulture, or a Certificate III in Rehabilitation Construction, or equivalent experience in rehabilitation. Hold relevant licenses in applicable weed management/ revegetation/ fauna management, any required insurances for scope of works and an understanding of required Laws, Act, Policies and Guidelines. Recommend changes to the documentation when specific experience or on-site conditions require so.

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References:

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AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	16/12/2025	CLIENT DRAFT	LS	SM
B	16/02/2026	AMENDMENTS	LS	SM
C	17/02/2026	AMENDMENTS	LS	SM

CLIENT: HB QLD PTY LTD

PROJECT: BINNIES ROAD RIPLEY

DRAWING TITLE: DETAILED REHABILITATION PLAN

DRAWING NO.: **11826 E 07 DRP C**

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - APPENDIX A *Weed Treatment and Removal (i)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
1	Mimosaceae	Acacia boliviana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
2	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3	T/A	Mechanical removal of small plants.	
3	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.4	T/A	Mechanical or chain removal.	
4	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
5	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	4	V/U	Tubers: Dig up, bag and remove.	
6	Agavaceae	Agave americana (century plant)	4	9	4	S/OA	Dig out by hand or machine	
7	Agavaceae	Agave sisalana (sisal)	2	4	4	S/OA	Dig out by hand or machine	
8	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	4	S/OA	Dig out by hand or machine	
9	Asteraceae	Ageratina adenophora (crofton weed)	6	38	5	H/O	Hand pull and hang to dry.	
10	Asteraceae	Ageratina riparia (mistflower)	5	38	5	H/O	Hand pull and hang to dry.	
11	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	4	H/UO	N/A	
12	Simaroubaceae	Ailanthus altissima (tree of heaven)	1	3	4	T/O	Seedlings: Hand pull	
13	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	1	3	5	Ha/U	Physical removal of plant should not be attempted	
14	Poaceae	Andropogon virginicus (whisky grass)	6	14	4	H/A	Hand pull or dig out small infestations.	
15	Basellaceae	Anredera cordifolia (madeira vine)	8	16	5	V/O	Small Vines & Tubers: Hand pull. Bag and dispose.	
16	Asclepiadaceae	Araujia sericifera (mothvine)	9	38	4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	
17	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4	V/O	Stems: Hand pull; Fruit: Bag and remove.	
18	Poaceae	Arundo donax (giant reed)	1	4	4	H/O	Physical removal of small infestations.	
19	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3	S/O	Hand pull; Slash	
20	Asparagaceae	Asparagus aethiopicus cv. Sprengeri (asparagus ground fern)	5	35	5	H/O	Dig out unwanted plants and dispose of at the appropriate council landfill. Remove the entire crown of underground stem of plant to prevent regrowth	
21	Asparagaceae	Asparagus africanus (ornamental asparagus, asparagus fern)	7	26	5	V/O	Dig out roots and dispose of at local council landfill site. Remove entire crown and underground stem to prevent regrowth	
22	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4	V/O	Rhizomes: crown and hang to dry.	
23	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	4	H/AO	Cut stems from roos.	
24	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	5	S/O	Seedlings: Hand pull	
25	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	4	H/U	Hand pull or cultivation.	
26	Poaceae	Brachiaria decumbens (signal grass)	4	14	4	H/A	Grazing	
27	Poaceae	Brachiaria mutica (para grass)	6	18	4	Ha/A	Grazing	
28	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of millions)	6	15	5	H/O	Hand pull and dispose	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
29	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	38	5	H/O	Hand pull and dispose	
30	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4	H/O	Hand pull and dispose	
31	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3	S,V/O	N/A	
32	Cabombaceae	Cabomba caroliniana (cabomba, fanwort)	4	12	5	Ha/F	Mechanical removal of small infestations	
33	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	4	S,V/O	Seed-heads: Bag and remove.	
34	Brassicaceae	Cakile edentula (American sea rocket)	4	24	4	H/U	Manually grub and destroy.	
35	Commelinaceae	Callisia fragrans (purple succulent)	3	9	4	H/O	N/A	
36	Cannaceae	Canna indica (canna lily)	3	9	3	H/O	Dig out entire plant	
37	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4	V/O	Seedlings & Small Vines: Hand Pull	
38	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3	ST/O	Hand pull small infesttions. Slashing can be used but should be followed up by herbicide application.	
39	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	
40	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	5	T/O	Remove when small. Hand pull or dig out small seedlings. Combine dozing, burning and controlled grazing for large infestations	
41	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4	H/A	Hand or mechanical removal of young plants	
42	Poaceae	Cenchrus echinatus (Mossman river grass)	8	43	3	H/A	Hand or mechanical removal of young plants	
43	Solanaceae	Cestrum parqui (green cestrum)	6	36	4	S/O	Seedlings: Hand pull	
44	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	6	14	3	ST/A	Seedlings: Hand pull	
45	Poaceae	Chloris gayana (Rhodes grass)	9	55	4	H/A	Hand pulling and removal and digging of larger clumps	
46	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	5	S/OA	N/A	
47	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	5	T/O	Seedlings: Hand pull	
48	Rubiaceae	Coffea arabica (coffee)	3	7	3	ST/A	Saplings: Hand pull	
49	Arecaceae	Colocasia esculenta (taro)	3	4	3	H/AO	Hand pull.	
50	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	4	H/O	Collect and Bag	
51	Asteraceae	Conyza bonariensis (flax-leaf fleabane)	7	38	3	H/U	Hand or mechanical removal of small infestations	
54	Poaceae	Cortaderia selloana (pampas grass)	2	1	4	H/O	Small Plants: dig out by hand or machine	
55	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4	V/O	Scattered or medium-density infestations: Where possible, repeated slashing close to ground level is recommended.	
56	Poaceae	Cynodon dactylon (couch, Bahama grass introduced cultivars)	10	45	4	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	
57	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	8	53	3	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
58	Cyperaceae	Cyperus involucratus (African sedge)	6	15	4	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	
59	Fabaceae	Desmodium intortum (greenleaf desmodium)	4	11	3	H/A	Hand pull or crown and dispose	
60	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	
61	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	4	H/A	Hand pull or cultivation	
62	Poaceae	Digitaria eriantha (pangola grass)	5	20	3	H/A	Hand pull or cultivation	
63	Verbenaceae	Duranta erecta (duranta)	6	14	4	ST/O	Shrubs: CS&P (1:1.5)	
64	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3	H/A	Hand or mechanical removal of small infestations	
65	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	4	H/A	Hand pull or dig out small infestations.	
66	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4	Ha/F	Hand pulling, cutting and digging with machines effective	
67	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	5	Ha/OF	Mechanical removal of small infestations	
68	Poaceae	Eleusine indica (crowsfoot grass)	8	55	4	H/A	Pull and chip. Replant with native couch.	
69	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first.	
70	Rosaceae	Eriobotrya japonica (loquat)	3	5	3	T/O	Seedlings: Hand pull	
71	Fabaceae	Erythrina crista-galli (cockspur coral tree)	2	4	4	T/O	N/A	
72	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	4	ST/O	N/A	
73	Euphorbiaceae	Euphorbia cyathophora (painted spuge)	8	20	3	H/O	Hand pull	
74	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3	H/O?	Hand pull	
75	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3	S/OA	Dig out by hand or machine	
76	Agavaceae	Furcraea selloa (hemp)	1	2	4	S/OA	Dig out by hand or machine	
77	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	4	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method.	
78	Colchicaceae	Gloriosa superba (glory lily)	3	26	4	V/O	N/A	
79	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	4	S/OU	Slash in winter and burn cuttings. Wanderer Butterfly can also be used as biological control.	

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CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD
RIPLEY

DRAWING TITLE
DETAILED
REHABILITATION PLAN

DRAWING NO.
11826 E A01 DRP C

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - APPENDIX A *Weed Treatment and Removal (ii)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland								
Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
80	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	5	Ha/F	Place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
81	Cactaceae	Harrisia martinii (harrisia cactus)	2	4	4	S/O	The use of the biological mealy-bug agent is recommended	
82	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	4	H/O	Small Plants: Hand pull and dispose	
83	Zingiberaceae	Hedychium gardnerianum (ginger lily)	1	3	4	H/O	Small Plants: Hand pull and dispose	
84	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S,V/O	Hand pull small infestations.	
85	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	Ha/F	Hand pull smal infestations. Can be controlled by planting competitive native species.	
86	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1	1	4	Ha/A	A combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	
87	Acanthaceae	Hypoestes phyllostachya (polka-dot plant	3	5	4	H/O	Hand pull or crown and dispose	
88	Balsaminaceae	Impatiens walleriana (balsam)	2	6	4	H/O	N/A	
89	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	
90	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
91	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3	T/O	Seedlings: Hand pull	
92	Euphorbiaceae	Jatropha gossypiifolia (cotton-leaf physic nut, bellyache bush)	1	1	4	S/O	Hand pull	
93	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	
94	Acanthaceae	Justicia betonica (squirreltail)	2	4	4	S/O	Hand pull smal infestations. Can be controlled by planting competitive native species.	
95	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	1	1	3.6	T/O	Seedlings: Hand pull	
96	Verbenaceae	Lantana camara var. camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	
97	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	5	S/O	Fire and/or mechanical control	
98	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4	ST/A	Small plants: Hand pull or mechanical removal	
99	Oleaceae	Ligustrum lucidum (tree privet)	5	9	5	T/O	Seedlings: Hand pull	
100	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	5	T/O	Seedlings: Hand pull	
101	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	4	H/O	Hand pull or crown and dispose	
102	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
103	Solanaceae	Lycium ferocissimum (African boxthorn)	1	5	4.4	S/O	N/A	
104	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	5	V/O	Tubers: crown or dig up, bag and remove.	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
105	Fabaceae	Macroptilium atropurpureum (siratro)	8	39	4	V/A	N/A	
106	Fabaceae	Macrotyloma axillare (perennial horse gram)	4	12	3	V,H/A	N/A	
107	Poaceae	Melinis minutiflora (molasses grass)	5	17	5	H/A	Grazing or mowing	
108	Poaceae	Melinis repens (red Natal grass)	10	134	4	H/A	Grazing or mowing	
109	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	4	S/A	N/A	
110	Moraceae	Morus alba (white mulberry)	3	10	3	T/O	N/A	
111	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	4	S/O	Seedlings: Hand pull	
112	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	
113	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	4	Ha/FU	Manually grub and destroy.	
114	Fabaceae	Neonotonia wightii (glycine)	5	16	5	H/A	N/A	
115	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations.	
116	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	4	Ha/OF	Hand pull small infestations.	
117	Ochnaceae	Ochna serrulata (ochna)	7	33	5	S/O	N/A	
118	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	
119	Oleaceae	Olea europaea (olive)	2	6	4	T/A	Seedlings: Hand pull	
120	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
121	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	H/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
122	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
123	Cactaceae	Opuntia stricta (common prickly pear)	7	67	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
124	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
125	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	5	H/A	Hand or mechanical removal of small infestations	
126	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4	H/U	Hand pulling of small areas is not recommended	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
127	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	4	H/A	Cut below crown.	
128	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	4	H/A	Hand pull or dig up	
129	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	
130	Poaceae	Paspalum notatum (bahia grass)	4	10	4	H/A	Hand pull or dig up	
131	Passifloraceae	Passiflora edulis (passion fruit)	6	12	3	V/AO	Hand Pull	
132	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	4	V/O	Hand Pull	
133	Passifloraceae	Passiflora suberosa (cork passionflower)	8	166	4	V/O	N/A	
134	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	4	V/O	Stems: Hand pull	
135	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/AO	Seedlings: Hand pull	
136	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	4	H/O	Hand Pull	
137	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	4	H/A	Hand Pull	
138	Poaceae	Pennisetum purpureum (elephant grass)	2	9	4	H/O	Grazing or mechanical removal	
139	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3	H/O	Hand Pull	
140	Verbenaceae	Phyla canescens (lippia, Condamine couch)	3	4	4	Ha/O	A combined approach of different control methods including chemical and mechanical with land management practices is most effective	
141	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	4	S/O	N/A	
142	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3	H/O	Hand pull or crown	
143	Pinaceae	Pinus elliottii (slash pine)	4	22	4	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	
144	Araceae	Pistia stratiotes (water lettuce)	3	8	4	Ha/OF	Mechanical removal of small infestations	
145	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.	
146	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	4	ST/A	Seedlings: Hand pull	
147	Myrtaceae	Psidium guajava and P. guineense (yellow guava and West Indes guava)	4	7	4	ST/AO	N/A	
148	Fabaceae	Pueraria lobata (kudzu)	3	4	4	V,S/O	Slash; Diminish by shading site	
149	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	
150	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	4	ST/O	Seedlings: Hand pull	

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CLIENT
HB QLD PTY LTD

PROJECT
BINNIES ROAD
RIPLEY

DRAWING TITLE
DETAILED
REHABILITATION PLAN

DRAWING NO.
11826 E A02 DRP C

BINNIES ROAD, RIPLEY

Detailed Rehabilitation Plan - APPENDIX A *Weed Treatment and Removal (iii)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland								
Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
150	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	4	ST/O	Seedlings: Hand pull	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
151	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	4	S/O	Seedlings: Hand pull	
152	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4	H/O	Hand pull and hang to dry.	
153	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	4	S/O	Slashing hinders growth, giving some control if plants are slashed before they seed	
154	Rosaceae	Rubus discolor (R. fruticosus complex, a blakberry)	4	10	4	S/OA	Slashing hinders growth, giving some control if plants are slashed before they seed	
155	Rosaceae	Rubus ellipticus (yellowberry)	4	26	4	S/O	Slashing hinders growth, giving some control if plants are slashed before they seed	
156	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	4	H/O	N/A	
157	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	
158	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	3	7	4	Ha/FO	Physical removal of small infestations.	
159	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	
160	Salviniaceae	Salvinia molesta (salvinia)	8	57	5	Ha/F	Mechanical removal of small infestations; Salvinia weevil (Biological control)	
161	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3	ST/O	Vines and Runners: hand pull, roll up and hang to dry.	
162	Dracaenaceae	Sansevieria trifasciata (sansevieria)	2	7	3	H/O	Hand pull or dig up	
163	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	5	T/O	Seedlings: Hand pull	
164	Asteraceae	Senecio madagascariensis (fire weed)	6	28	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
165	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
166	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4	ST/O	Seedlings: Hand pull	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
167	Caesalpiniaceae	Senna septemtrionalis (arsenic bush, was S. floribunda)	6	25	4	S/O	Seedlings: Hand pull	
168	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3	H/O	Hand pull or dig up	
169	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	4	H/A	Hand pull or dig up	
170	Malvaceae	Sida rhombifolia (Paddy`s lucerne)	9	69	4	S/U	Hand pull or dig out.	
171	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	4	H/U	Hand pull or cultivation.	
172	Solanaceae	Solanum erianthum (a tobacco bush)	7	19	3	S/O	Hand pull	
173	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	4	S/O	Hand pull	
174	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	
175	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	78	4	V/O	Hand pull	
176	Solanaceae	Solanum torvum (devil's fig)	6	39	4	S/O	Seedlings: Hand pull	
177	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4	H/O	Hand pull and hang to dry.	
178	Bignoniaceae	Spathodea campanulata (African tulip tree)	1	1	3	T/O	N/A	
179	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	5	H/O	Hand pull	
180	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	5	H/U	Hand or mechanical removal of small infestations	
181	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	5	H/U	Hand or mechanical removal of small infestations	
182	Poaceae	Sporobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	5	H/U?	Hand or mechanical removal of small infestations	
183	Poaceae	Stenotaphrum secundatum (buffalo grass)	3	23	3	H/AO	Hand or mechanical removal of small infestations	
184	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3	H/A	N/A	
185	Arecaceae	Syagrus romanzoffiana (queen palm)	4	10	4	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	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 (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
186	Asteraceae	Tagetes minuta (stinking roger)	8	32	3	H/U	Hand pull and hang to dry.	
187	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	ST/O	N/A	
188	Bignoniaceae	Tecoma stans (yellow bells)	4	16	4	ST/O	N/A	
189	Poaceae	Themeda quadrivalvis (grader grass)	8	25	4	H/A	Hand pull or dig out small infestations.	
190	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4	H/O	N/A	
191	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5	V/O	N/A	
192	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	
193	Fabaceae	Tipuana tipu (tipuana)	2	5	3	T/O	Seedlings: Hand pull	
194	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	4	H/O	N/A	
195	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4	H/O	N/A	
196	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	4	H/O	N/A	
197	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/U	Hand pull	
198	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
199	Iridaceae	Watsonia meriana var. bulbillifera (bulbil watsonia)	2	3	3	H/O	Dig up, bag and remove	
200	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3	H/O	Seedlings: Hand pull	

Explanatory notes.

Sub-region (Sr): Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded (Queensland Herbarium data).
Rec no. (R): Total number of records for species within study area, Queensland Herbarium CORVEG and HERBRECS data.
Scores (S): Based on panel data of invasiveness, 5 (highest) to 3 (moderate). ? indicate doubtful scores.

Life forms (LFS): T-tree (woody plant >5m), ST-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: A-agriculture, O-ornamental and landscaping, F-fish aquarium, U-unintentional introduction and/or contaminant.

Abbreviations: Control Methods

CS&P = cut scrape and paint

S&P = scrape and paint

C&P = cut and paint

F/I = frill or inject stem

Abbreviations: Herbicides

G = Glyphosate, eg. Roundup Biactive, Weedmaster Duo

MM = Metsulfuron methyl, eg, Brushoff

F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications

GU = Glyphosate undiluted

G1 = 1 part water to 1 part glyhphosate

G1.5 = 1.5 parts water to 1 part glyphosate

G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations

G100 = 100mL glyphosate per 10L of water + surfuctant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfuctant, eg 50mL LI 700 per 10L

G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water

MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water

F100 = 100mL fluroxypyr per 10L water

F150 = 150mL fluroxypyr per 10L water

Other Abbreviations

= Locally non-indigenous native species

Ref. 1. Big Scrub Rainforest Landcare Group (2008), 'Common Weeds of Subtropical Rainforests of Eastern Australia: A practical manual on their identification and control'

Ref. 2. Department of Primary Industries and Fisheries (QLD), 'Weeds and pest animals and ants'.

Ref. 3. Holland et al. (1996), 'Suburban Weeds', DPI QLD.

Ref 4. Port Stephens Council (NSW), 'Weed Busters'.
Ref 5. Depertment of Primary Industries (NSW), 'Noxious and Environmental Weed Handbook, 3rd Edition'.
Ref 6. Department of Environment and Conservation, 'Florabase', (DEC- WA)

Ref 7. Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

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