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**).

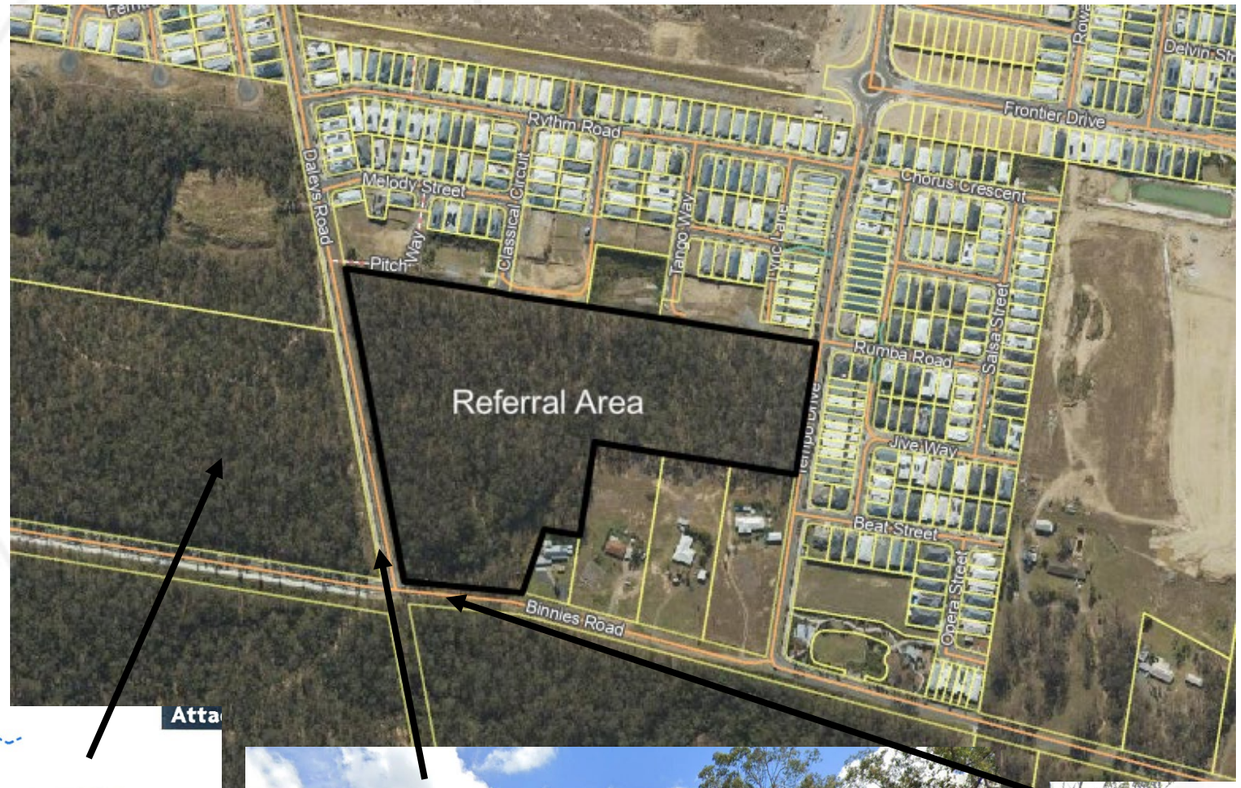
Photo set 2: Highly disturbed vegetation dominated by weeds and regrowth in the south-eastern extents of the referral area.

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.		
			Temporary fauna friendly fencing	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**
			Stockpiling of cleared vegetation ensures safe fauna movement	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: Light and noise disturbance 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.	CEMP and Restricted construction hours CEMP	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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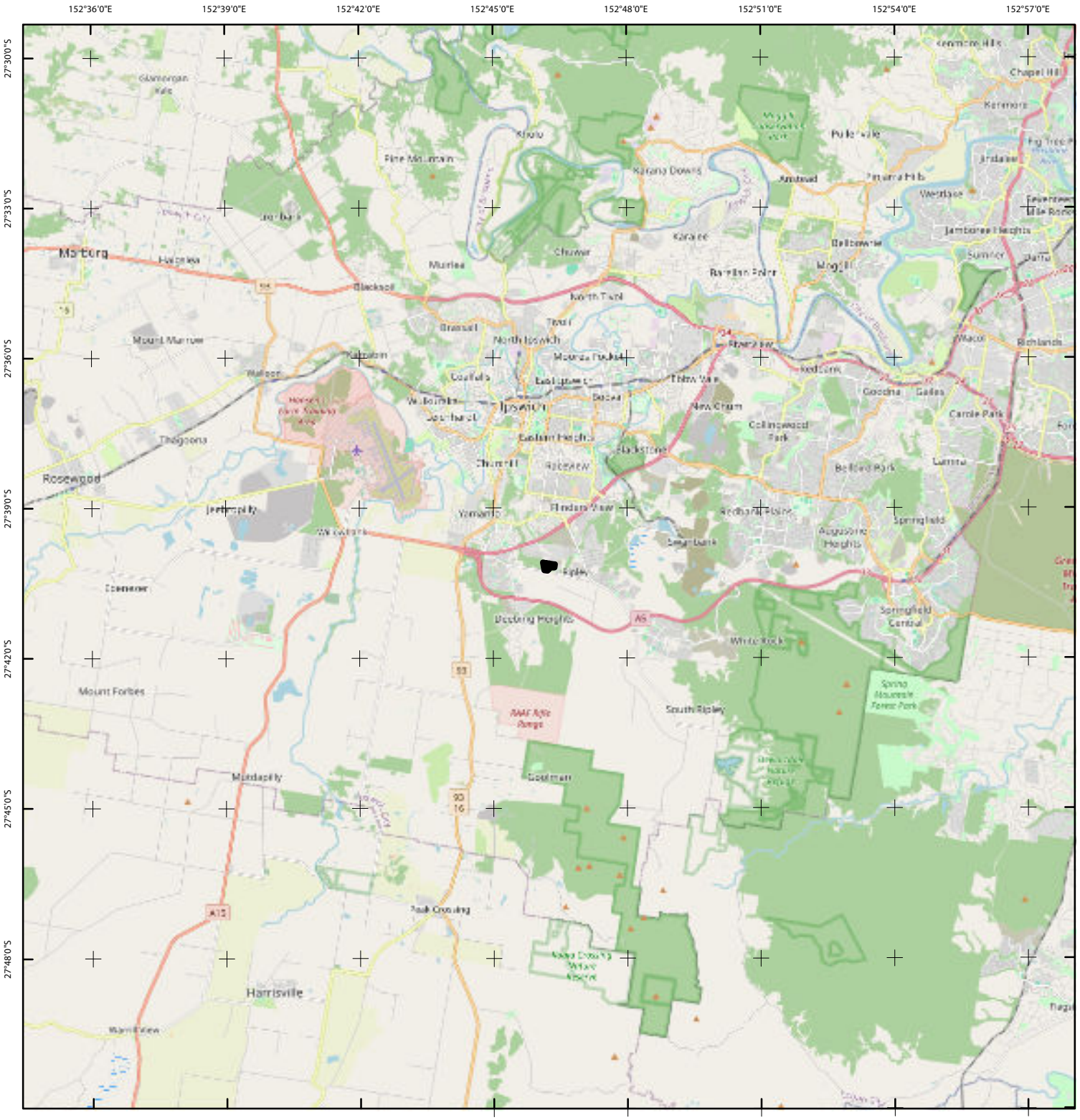
12. Figures and Plans



LEGEND

Site DCDB

Figure 1

Site Context

CLIENT

HB QLD
PTY LTD

FILE REFERENCE
11826 E Figure 1 Site Context A_

DATE
8/07/2025

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COORDINATE SYSTEM
GDA 2020 MGA Z56

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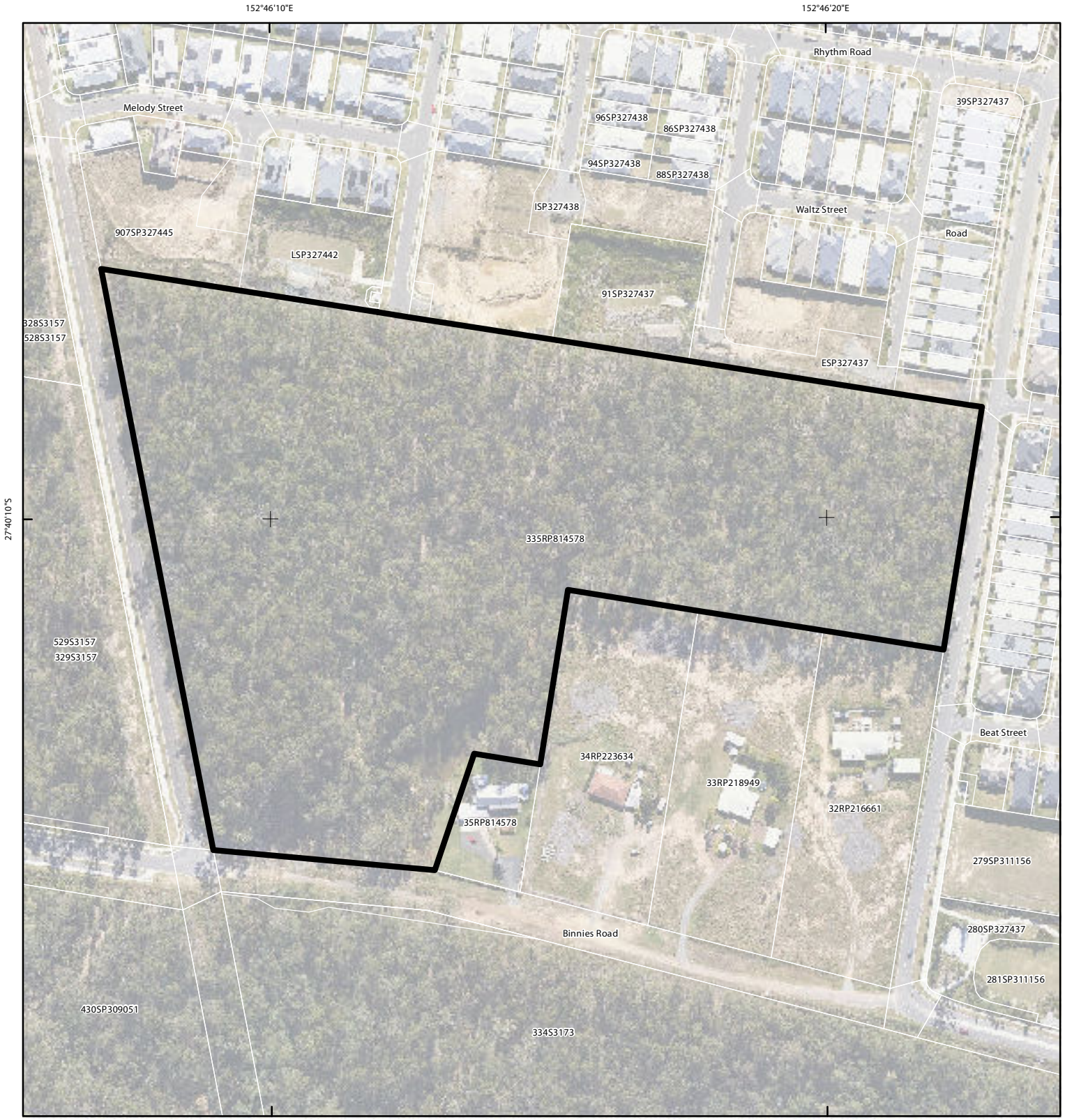
1300 123 744 | mail@saundershavill.com



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

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COORDINATE SYSTEM
GDA 2020 MGA Z56

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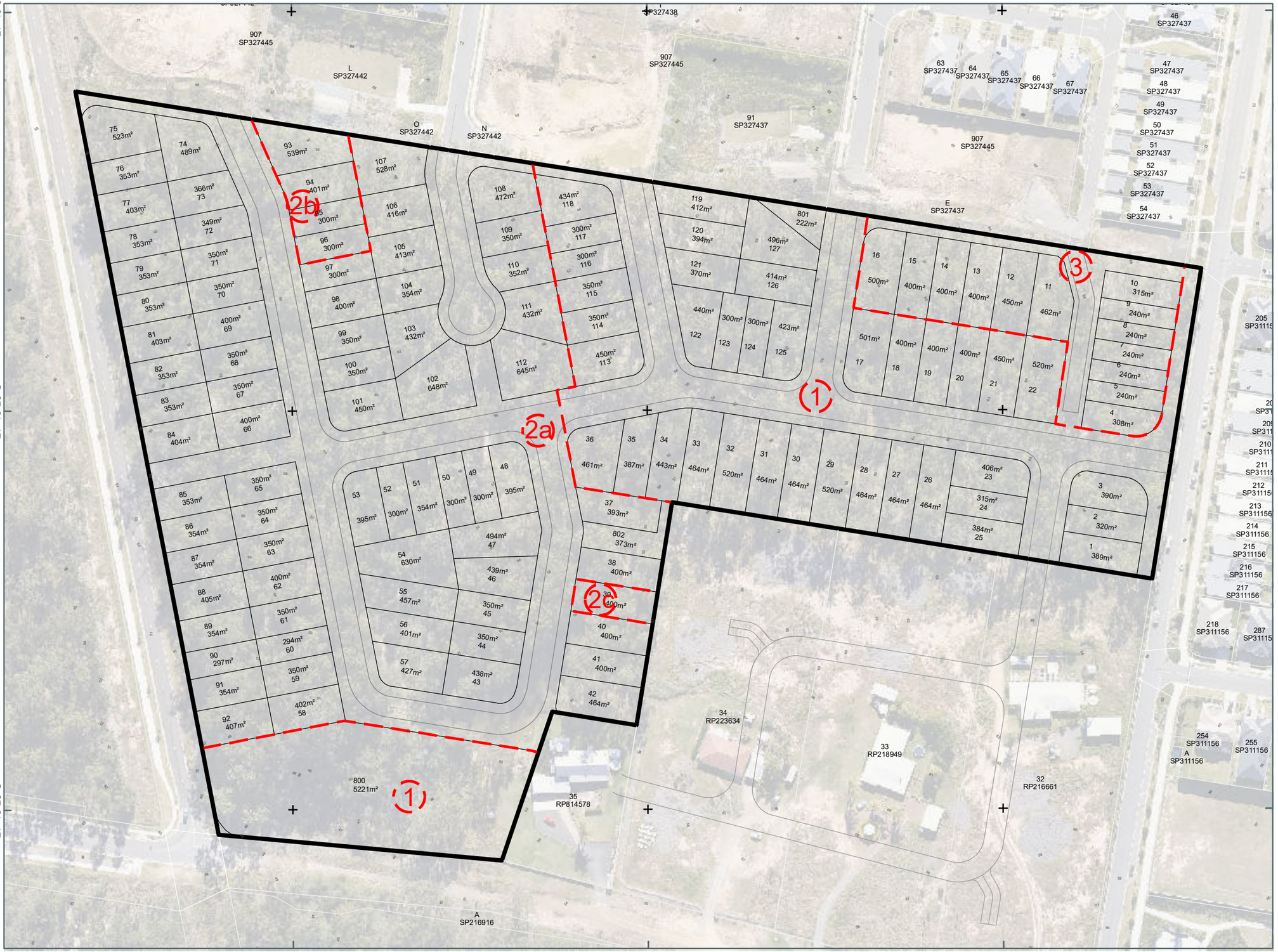
A01. DEVELOPMENT LAYOUT



Notes:
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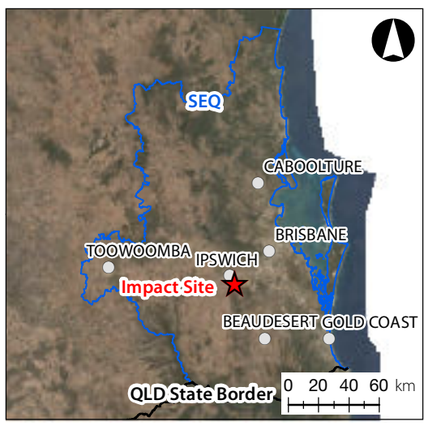
LEGEND

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



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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

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Transverse Mercator
GDA 2020 | Zone 56

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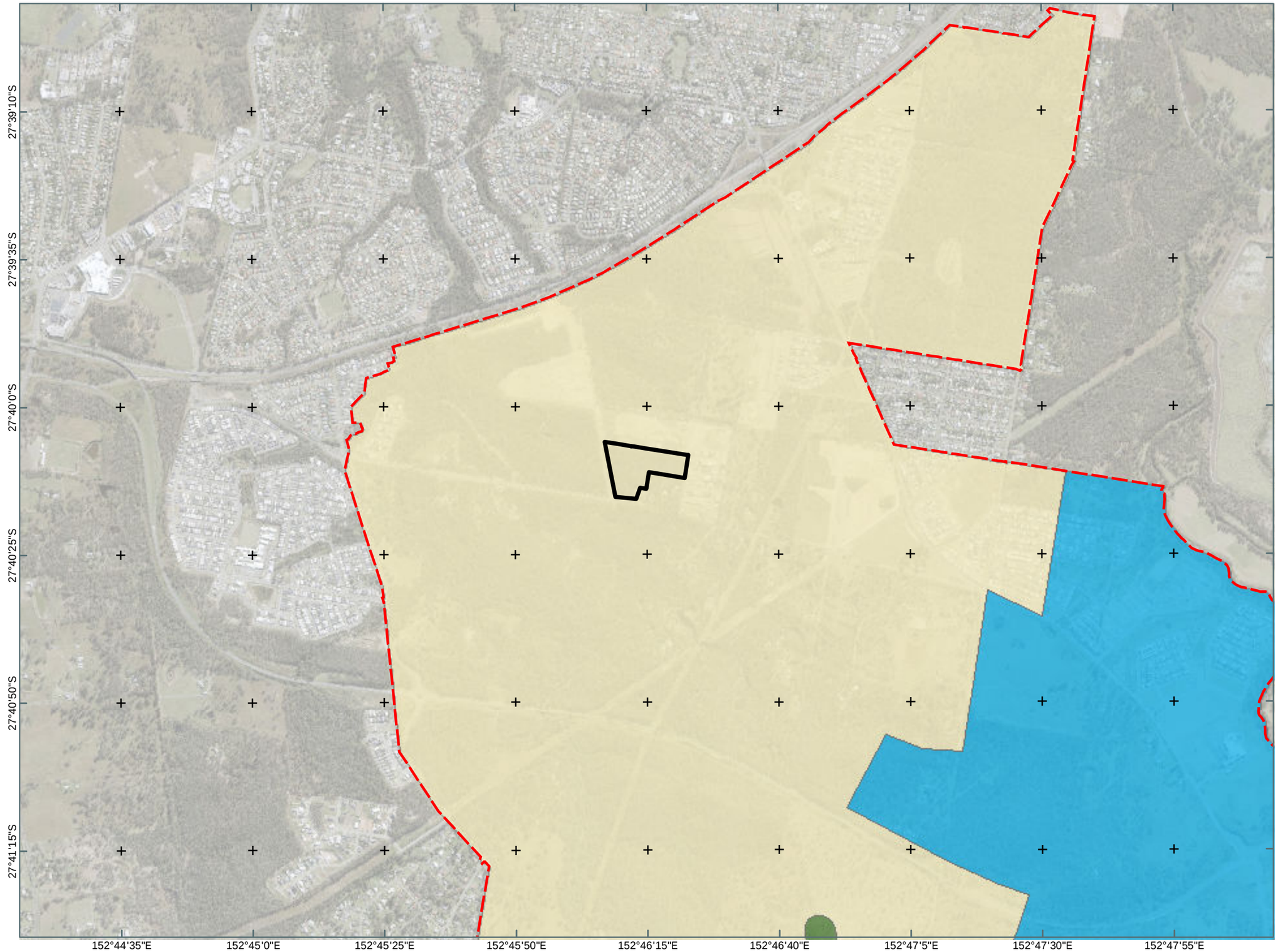
Address / RPD: *Lot 335 on RP814578*

7/07/2025

11826 E A01 Development A_

A02. DEVELOPMENT LAYOUT



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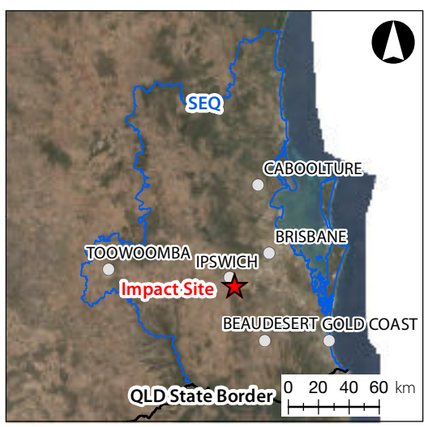
LEGEND

- Referral Area
- Ripley Valley PDA Boundary

PDA Zoning

- Urban Core
- Urban Living
- Environmental Protection



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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 250 500 m

Transverse Mercator
GDA 2020 | Zone 56

N

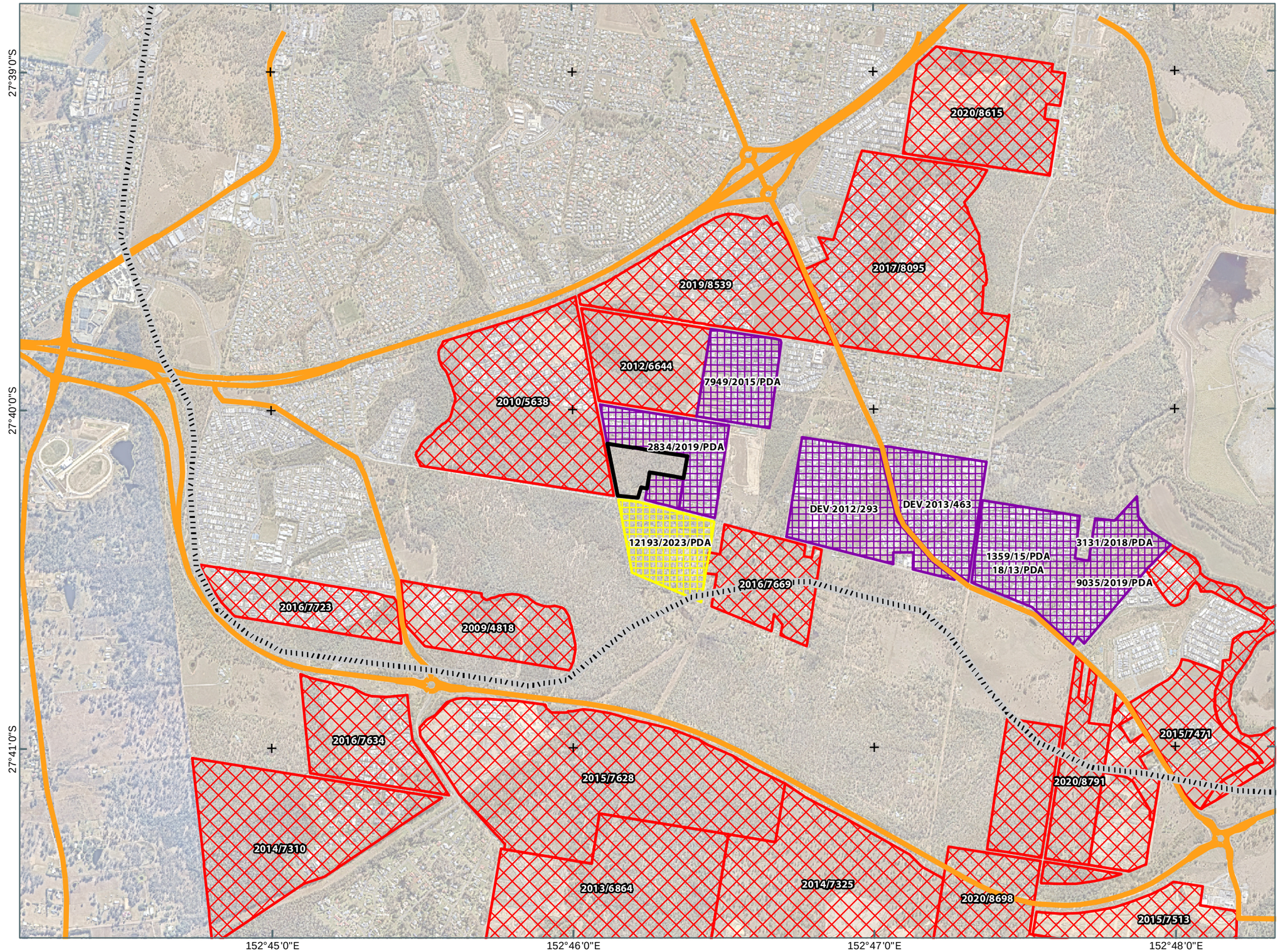
1:20,000
@ A3

Address / RPD: *Lot 335 on RP814578*

7/07/2025

11826 E A02 RV PDA A_

A03. SURRONDING APPROVALS



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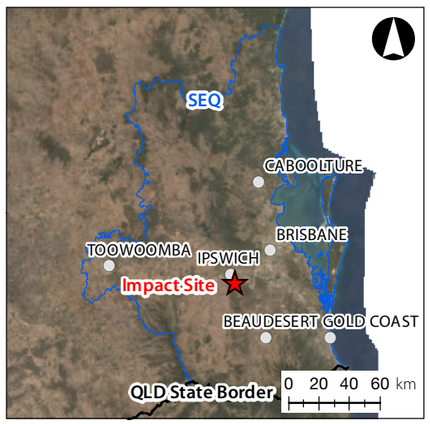
LEGEND

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



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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 300 600 m
Transverse Mercator
GDA 2020 | Zone 56

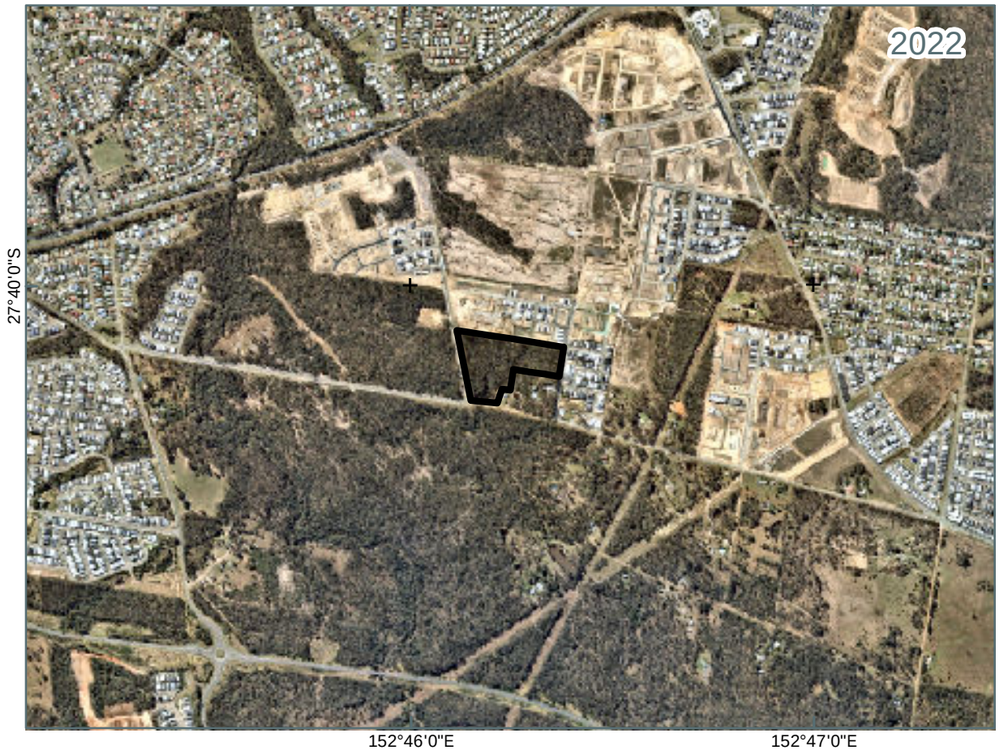
N
1:21,000 @ A3

Address / RPD: *Lot 335 on RP814578*

16/12/2025

11826 E A03 Surronding Approvals A

A04. DEVELOPMENT LAYOUT



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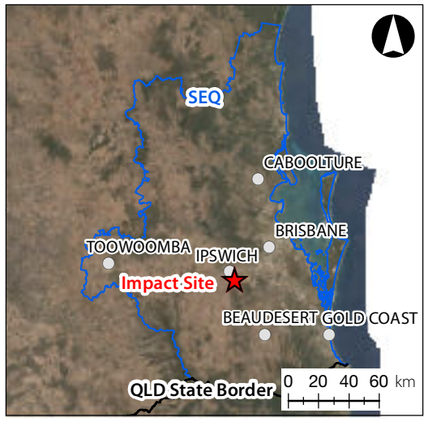
Layer Sources

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

Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

LEGEND

- Qld DCDB
- Referral Area



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0 300 600 m
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N
1:25,000
@ A3

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11826 E A04 Aerial History A_

A05. TOPOGRAPHY

Notes:
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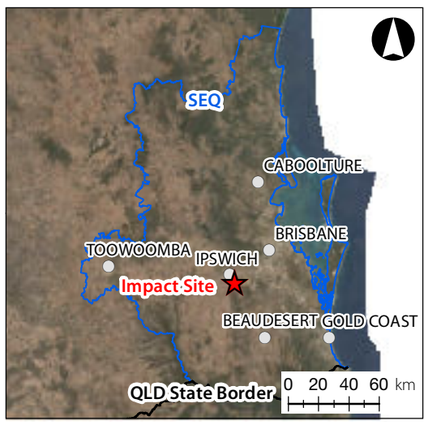
Layer Sources

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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0 20 40 m

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N

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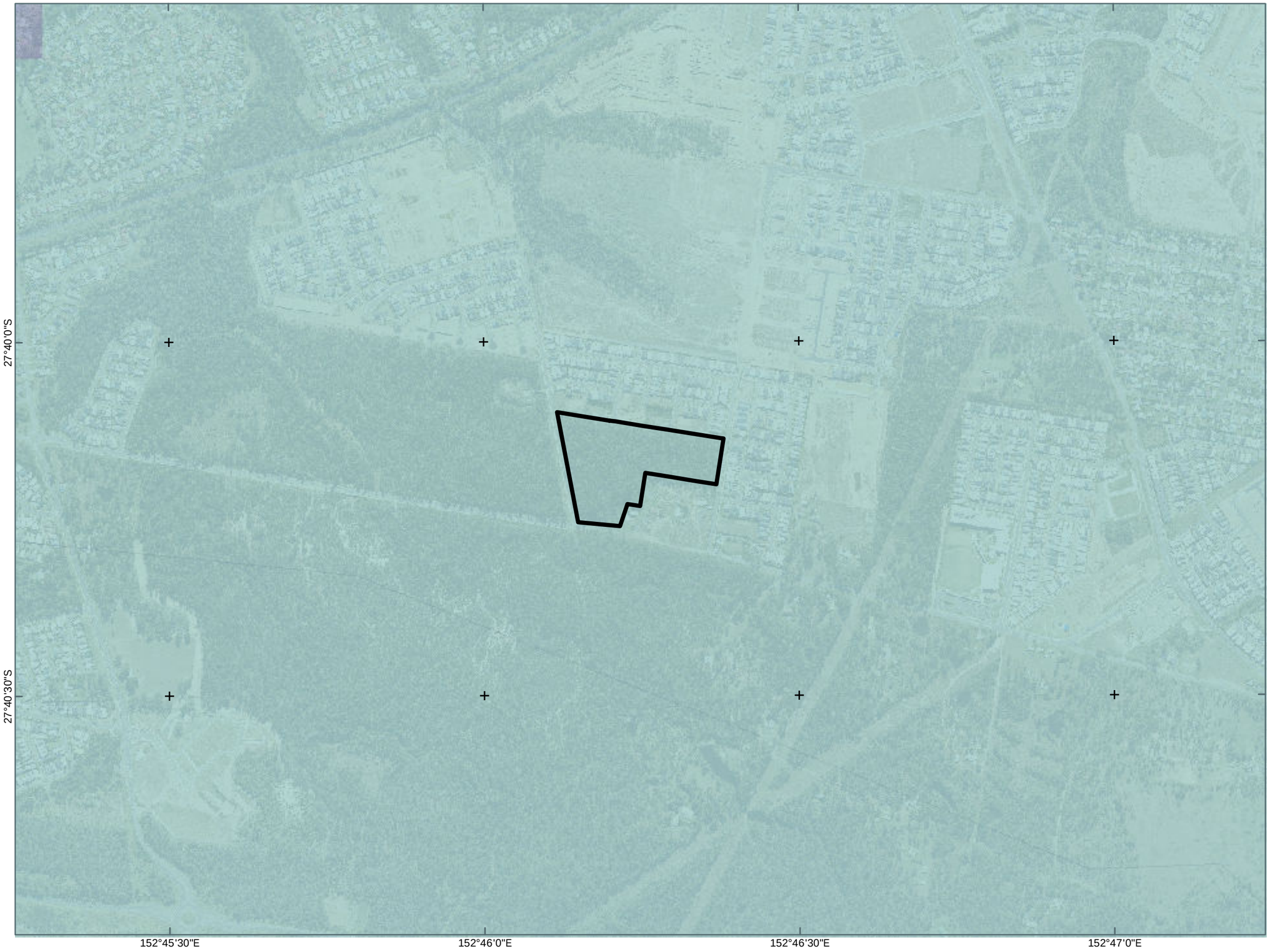
11826 E A05 Topography A_

A06. ASIRIS SOIL CLASSIFICATION (LEVEL 5)



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Layer Sources

Updated data available at
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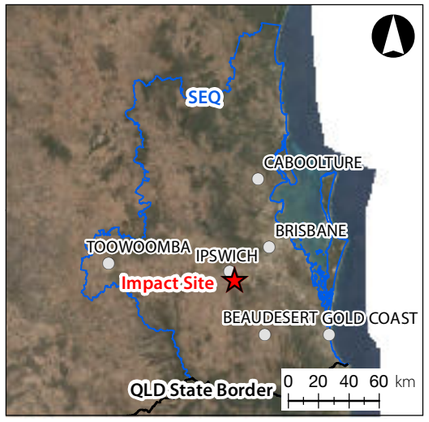
LEGEND

Referral Area

Australian Soil Classification

Sodosols

Vertosols



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1:10,000
@ A3

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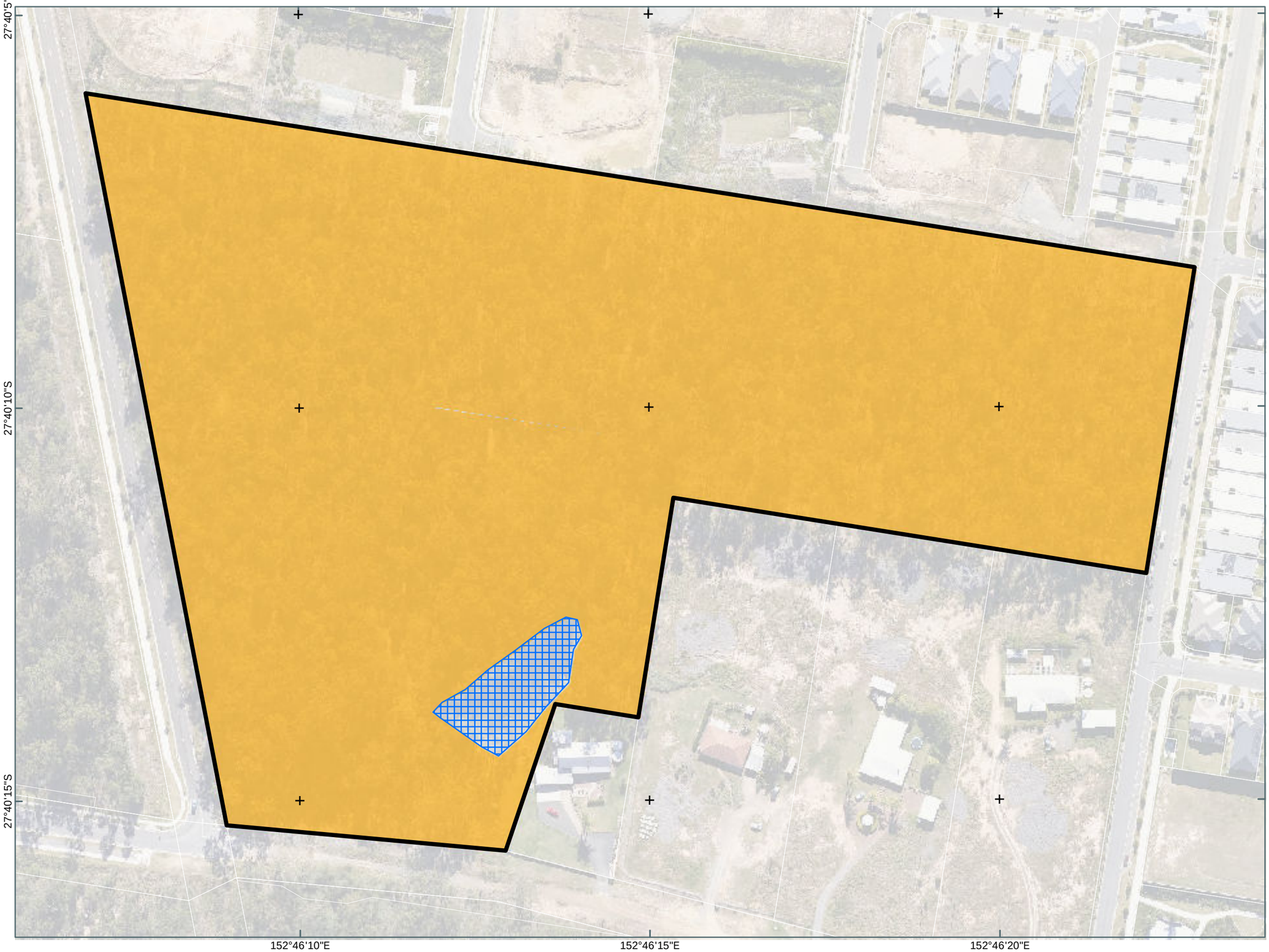
11826 E A06 Soils A_

A07. VEGETATION COMMUNITIES



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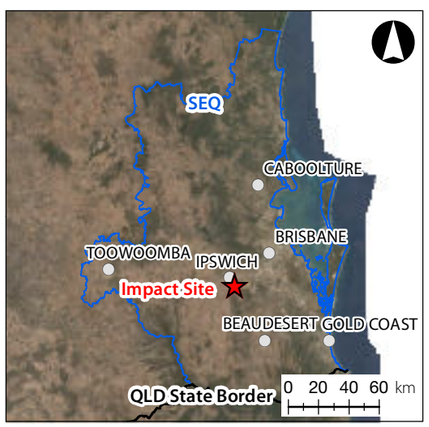
LEGEND

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



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0 20 40 m
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1:1,500 @ A3

Address / RPD: *Lot 335 on RP814578*

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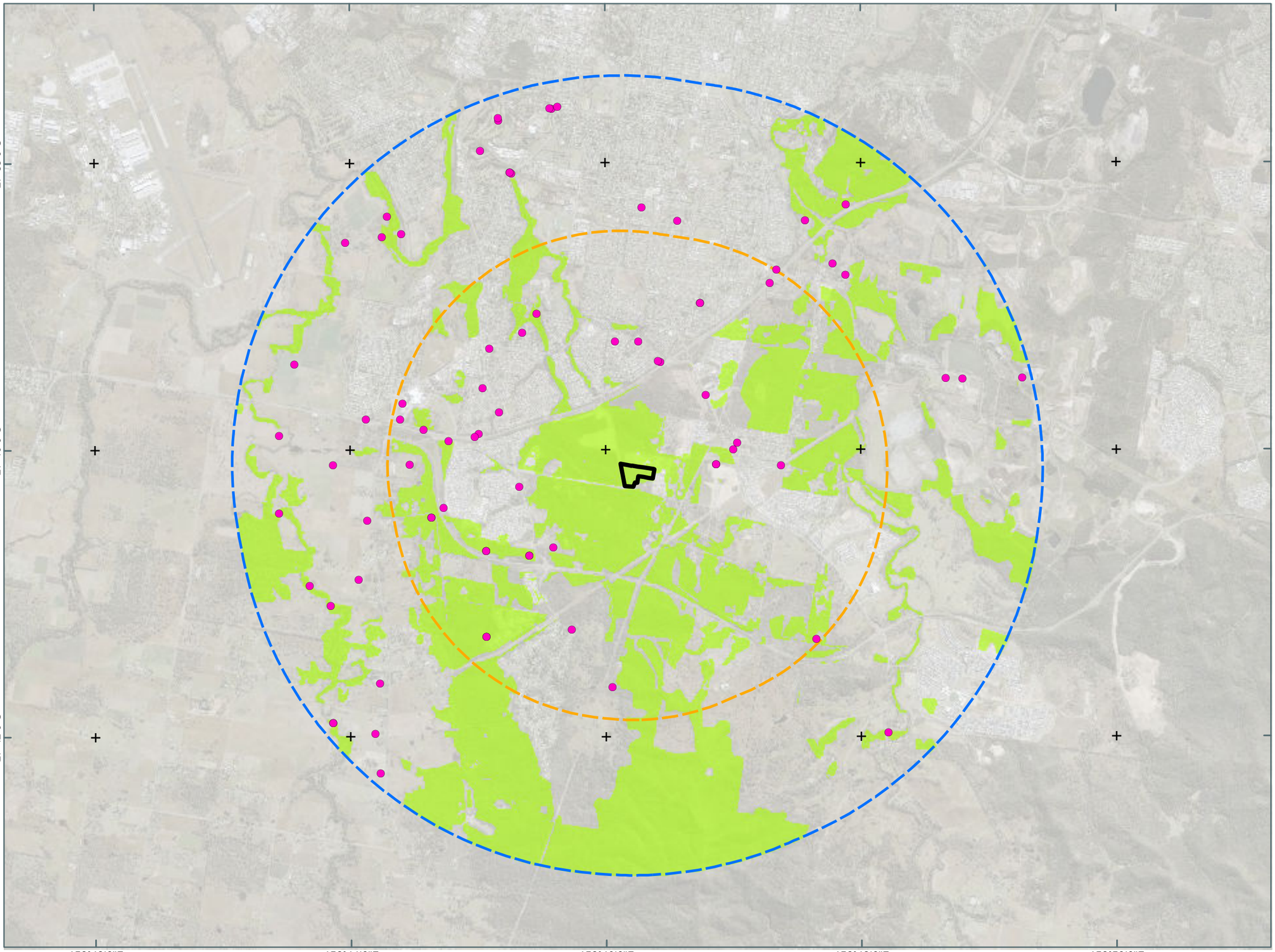
11826 E A07 Vegetation Communities A_

A08. KOALA HABITAT AND RECORDS



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Layer Sources

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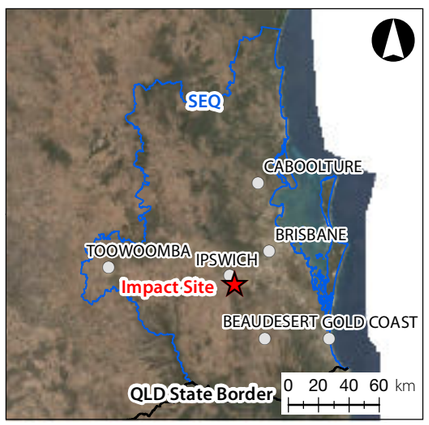
LEGEND

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

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1:50,000
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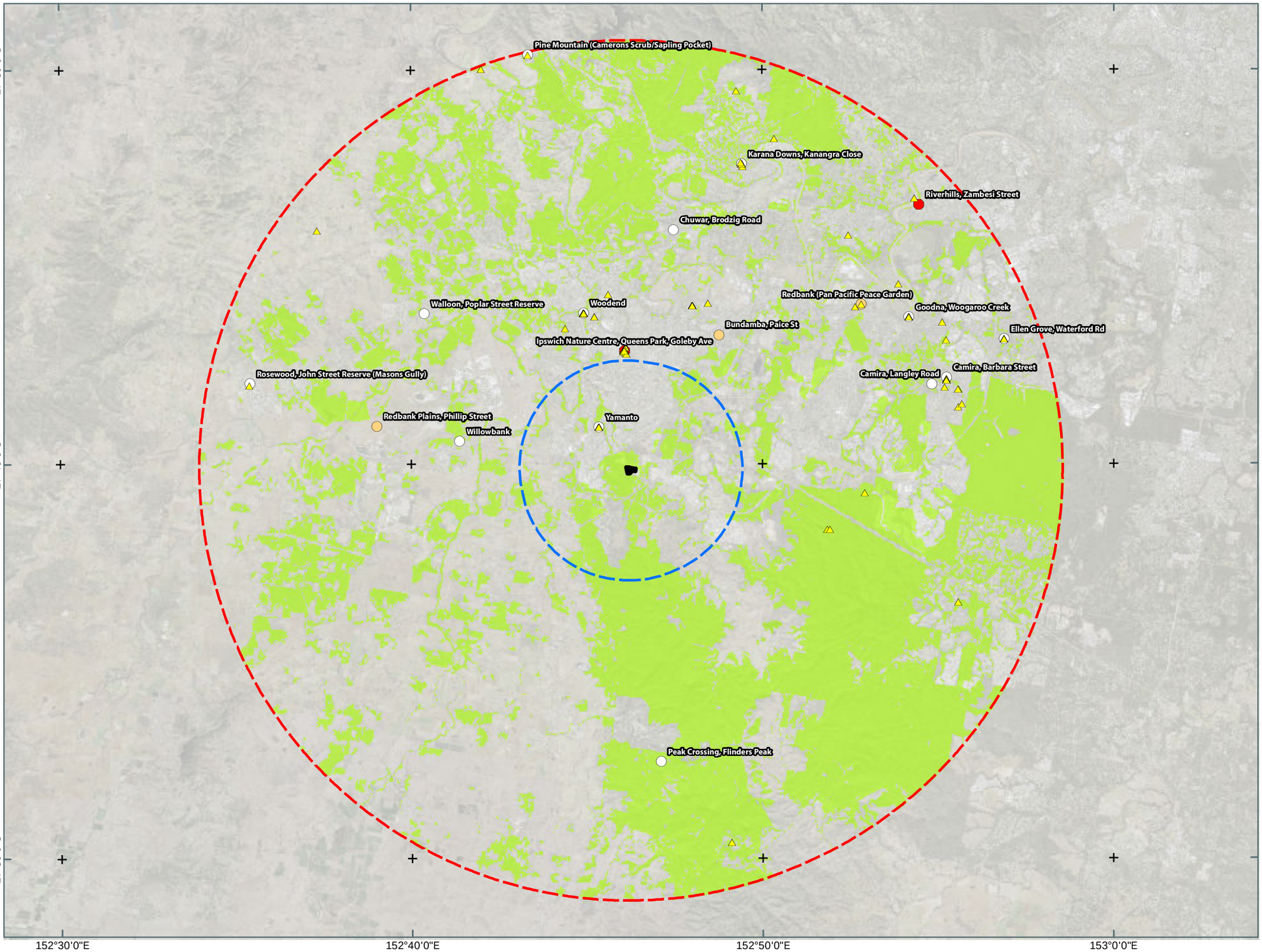
8/07/2025

11826 E A08 Koala Records A_

A09. GREY-HEADED FLYING-FOX HABITAT AND RECORDS



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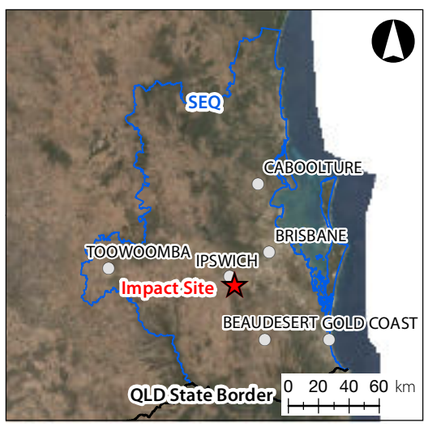
LEGEND

- 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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@ A3

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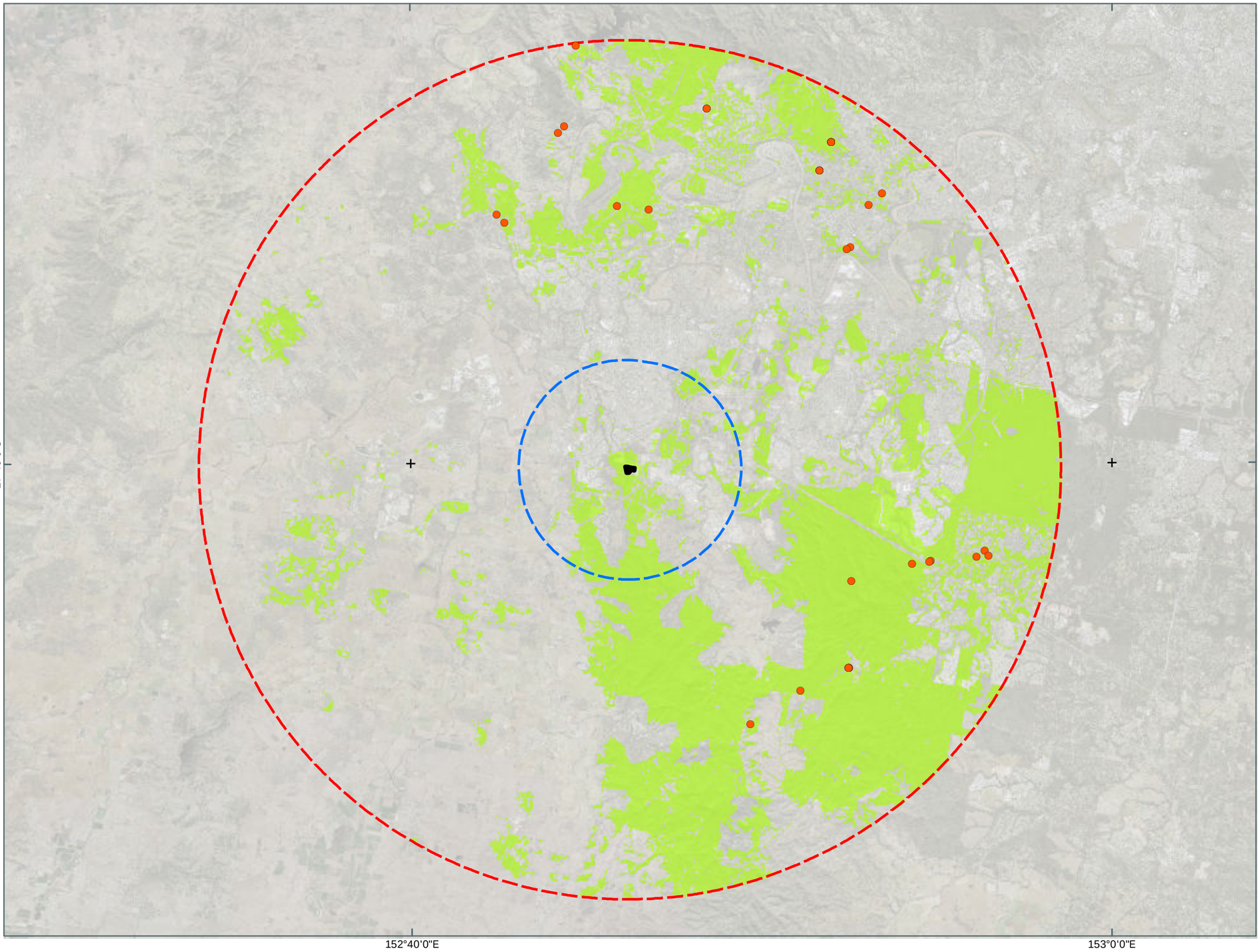
11826 E A09 GHFF Records A_

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



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Layer Sources

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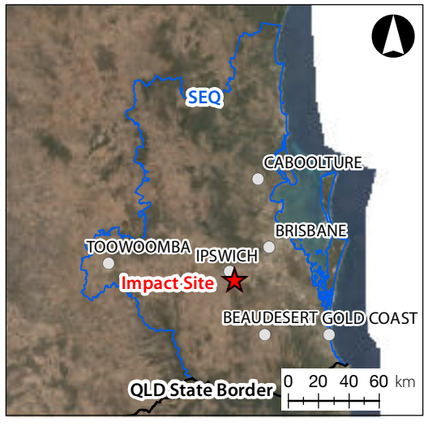
LEGEND

- 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
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N
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@ A3

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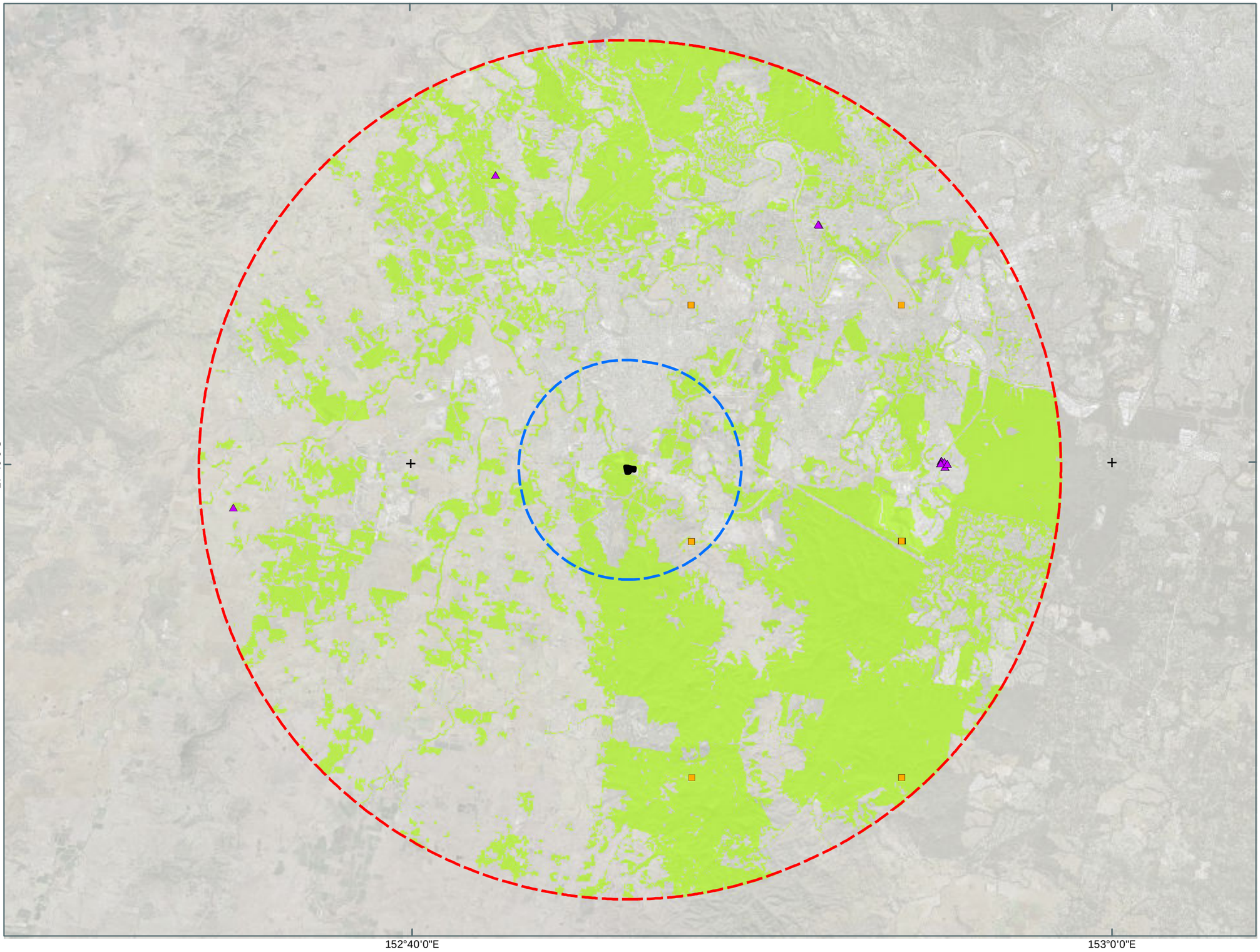
8/07/2025

11826 E A10 GBC Records A_

A11. SWIFT PARROT AND REGENT HONEYEATER HABITAT AND RECORDS



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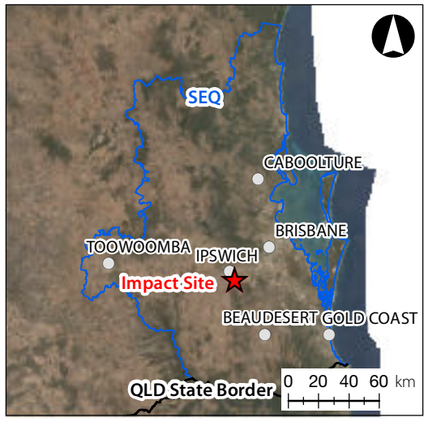
LEGEND

- 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
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N
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@ A3

Address / RPD: *Lot 335 on RP814578*

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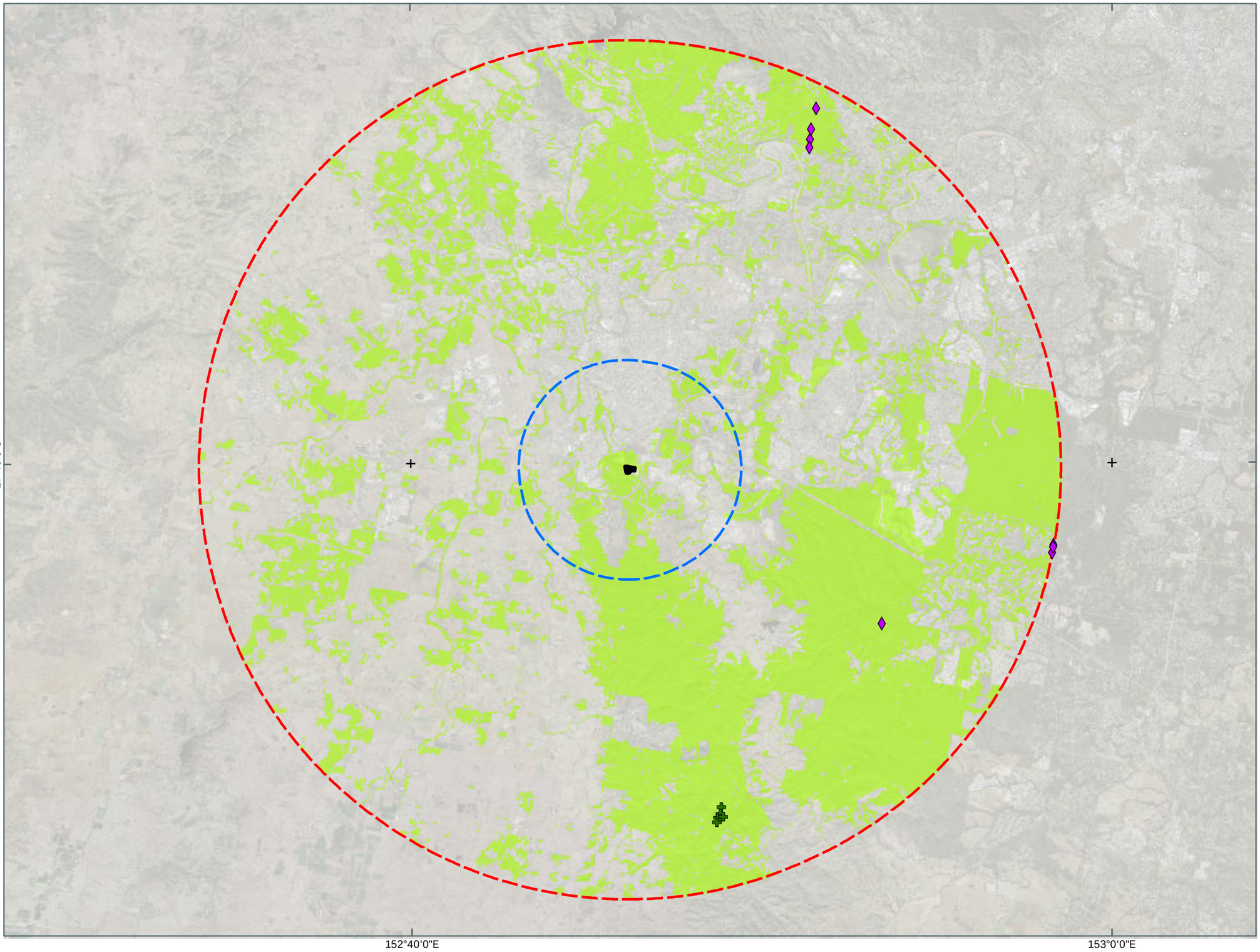
11826 E A11 SP RH Records A_

A12. GREATER GLIDER HABITAT AND RECORDS



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Layer Sources

Updated data available at
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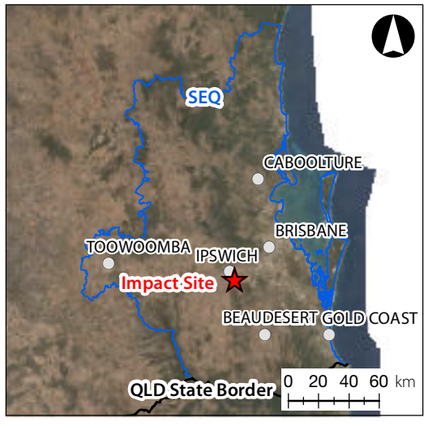
LEGEND

- 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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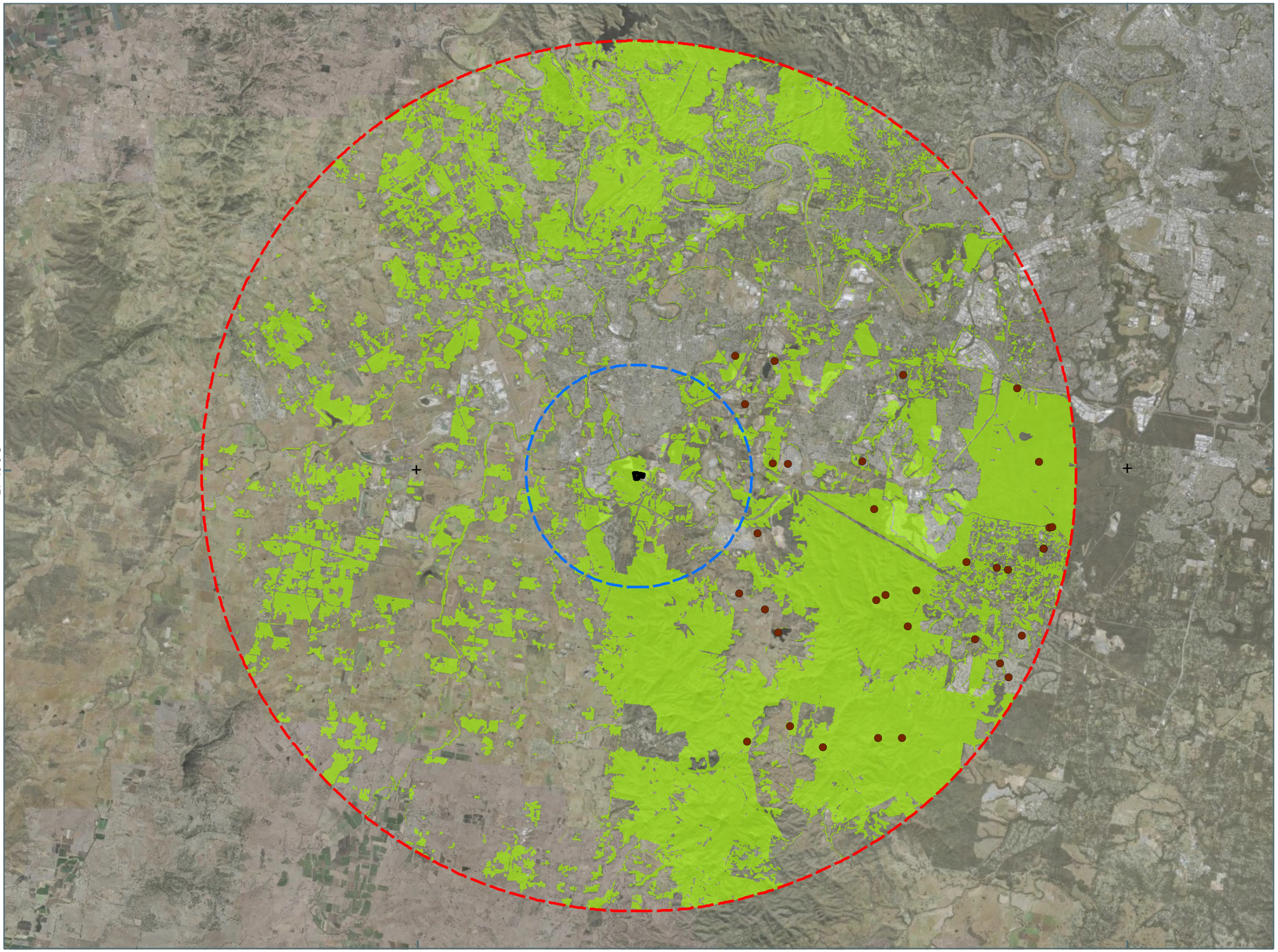
11826 E A12 GG Records A_

A13. YELLOW-BELLIED GLIDER HABITAT AND RECORDS



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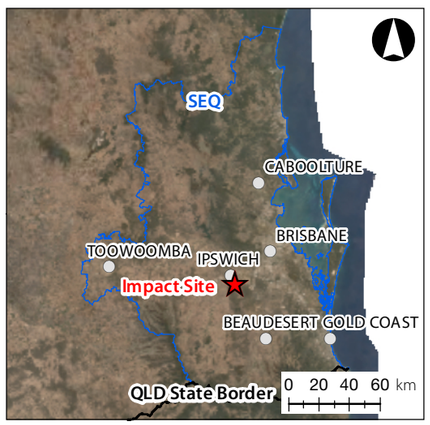
Layer Sources

Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

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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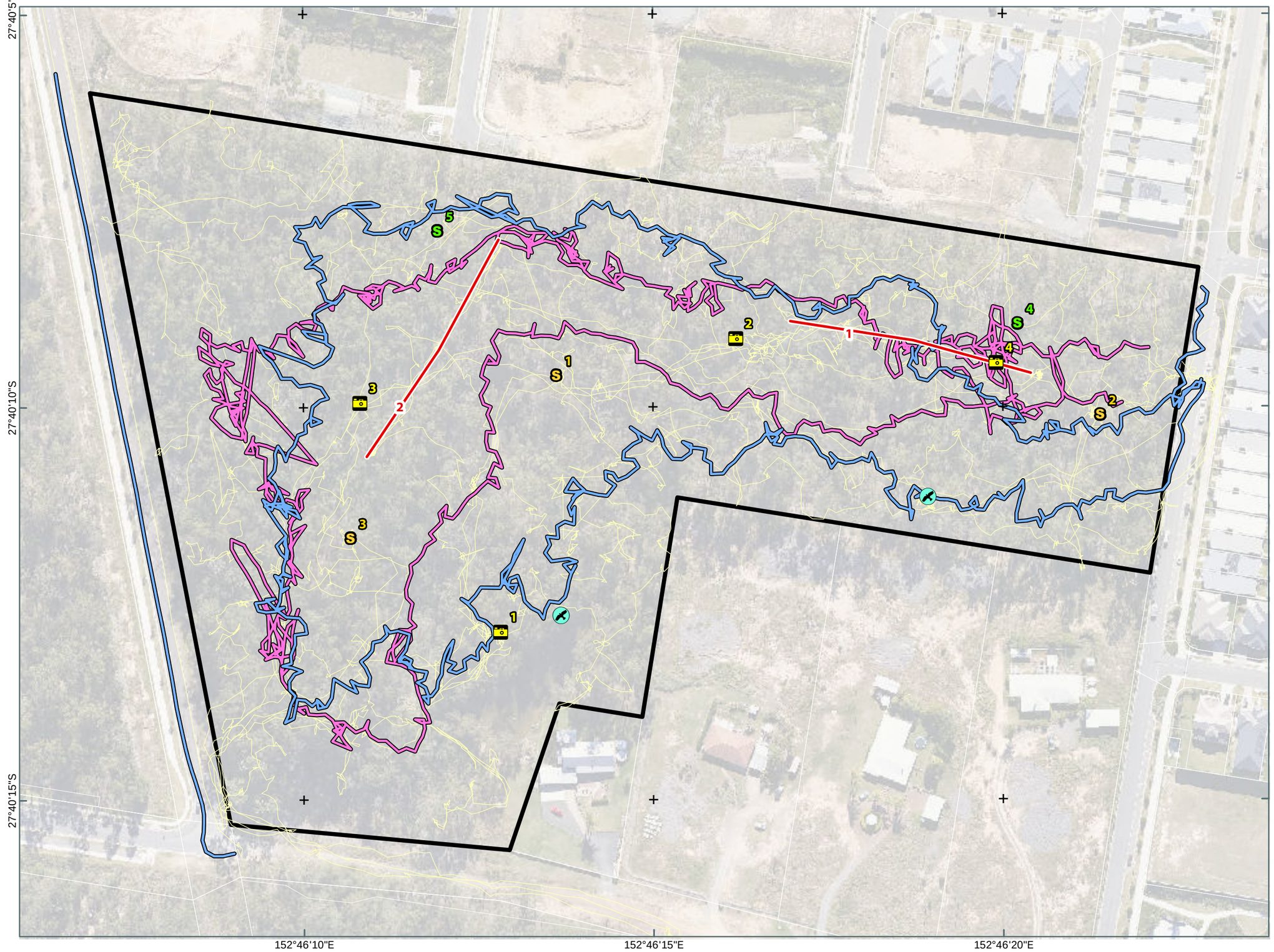
11826 E A13 YBG Records A

A14. FIELD SURVEY EFFORT



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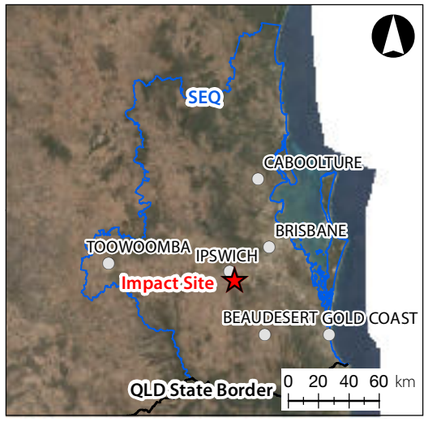
LEGEND

- 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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10/07/2025

11826 E A14 Field Survey A

A15. FIELD RESULTS

Notes:
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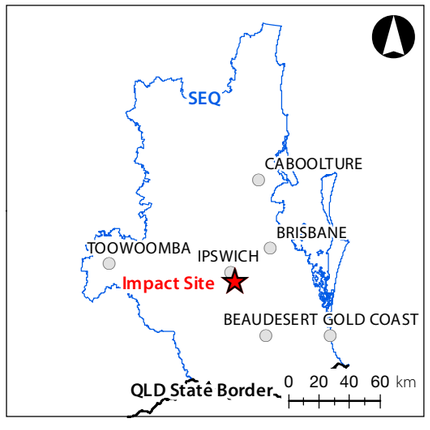
Layer Sources

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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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 20 40 m
Transverse Mercator
GDA 2020 | Zone 56

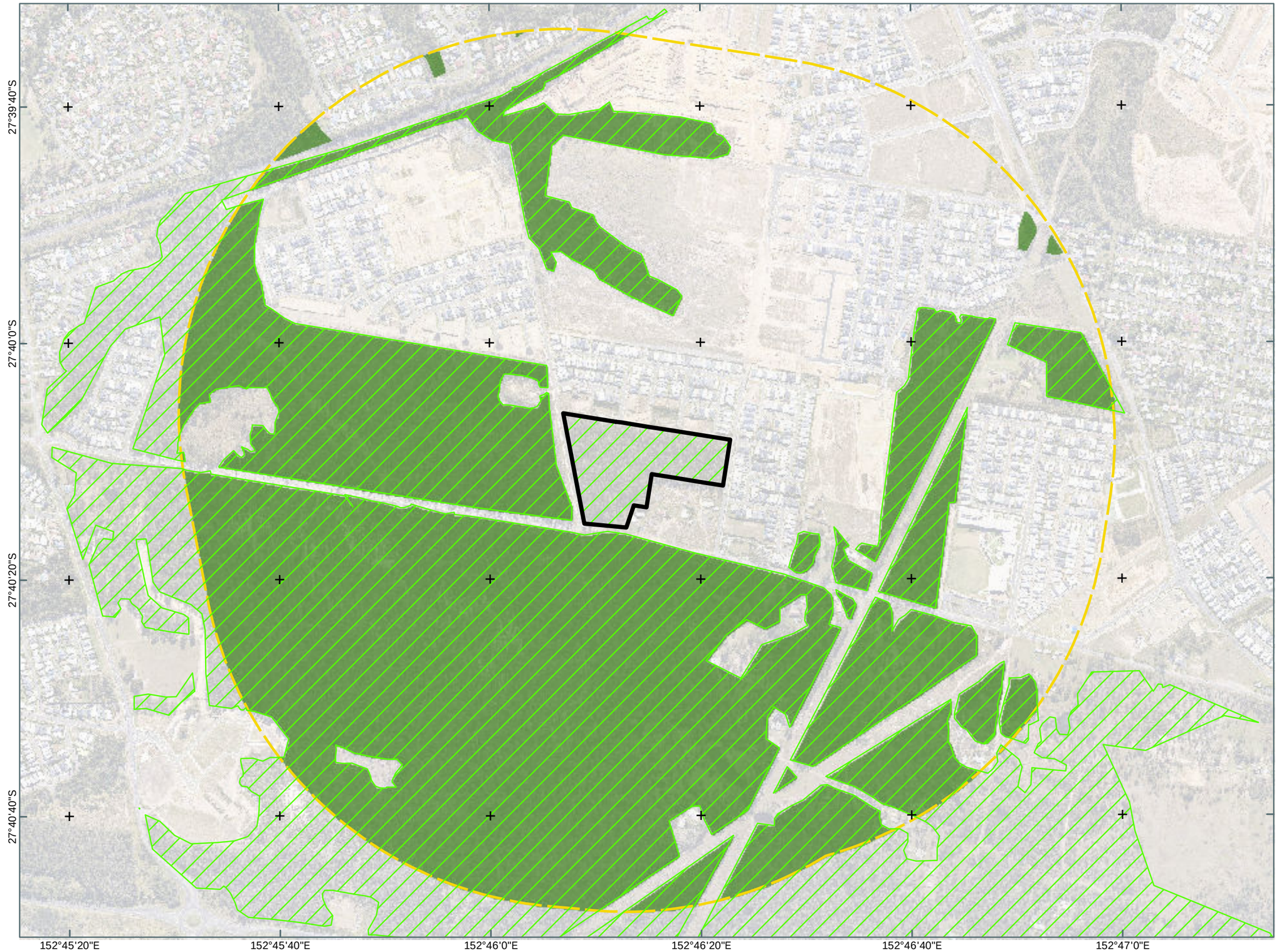
N
1:1,500
@ A3

Address / RPD: *Lot 335 on RP814578*

16/12/2025

11826 E A15 Field Results A

A16. KOALA CONTEXT



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Layer Sources

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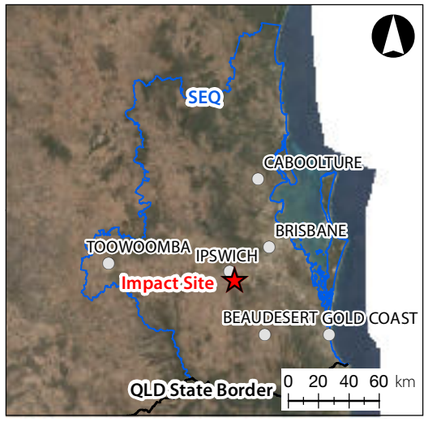
* This note is an integral part of this plan/data. Reproduction of this plan or any part

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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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 100 200 m
Transverse Mercator
GDA 2020 | Zone 56

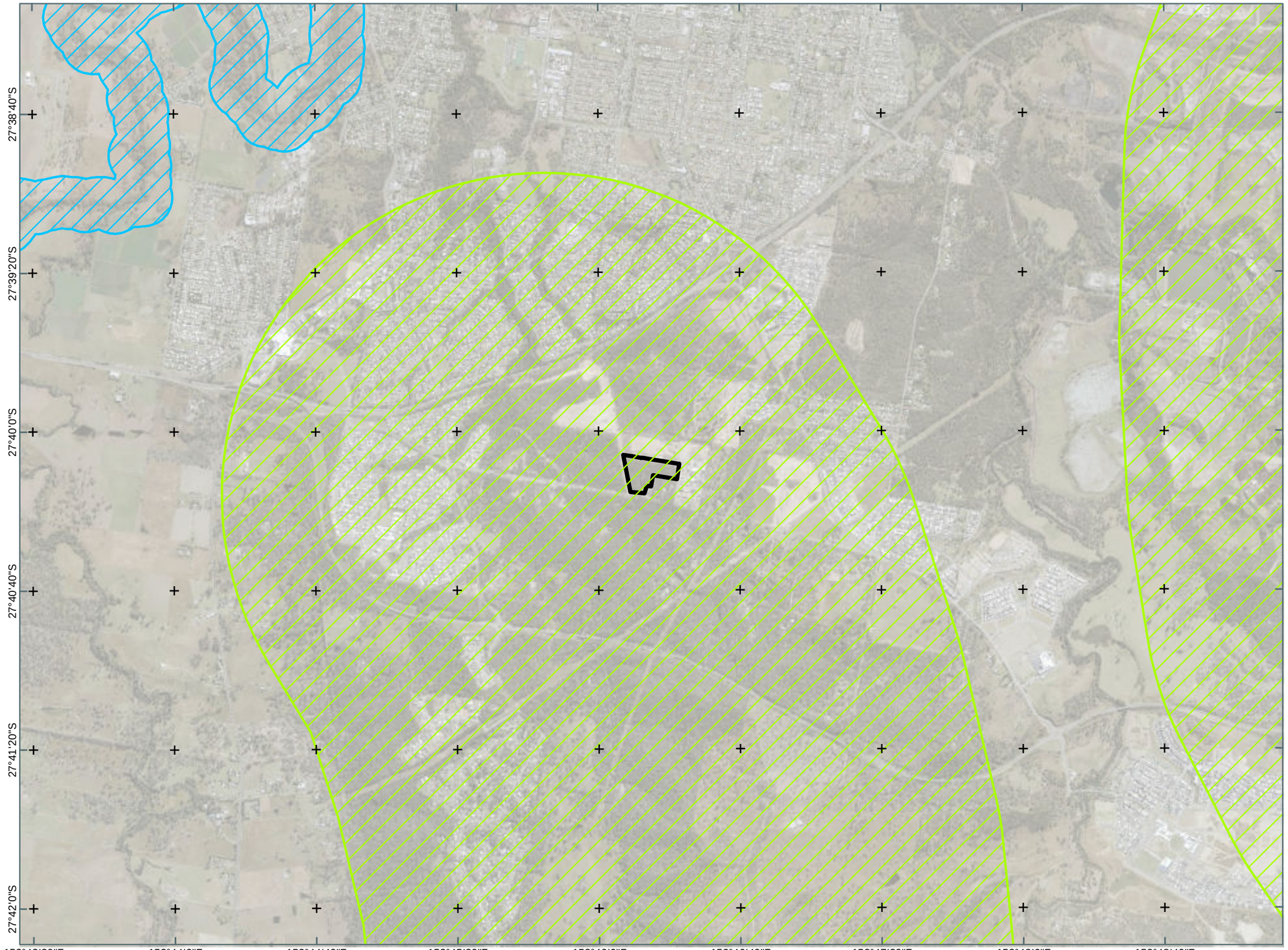
N
1:10,000
@ A3

Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A16 Koala Context A_

A17. ECOLOGICAL CORRIDORS



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Layer Sources

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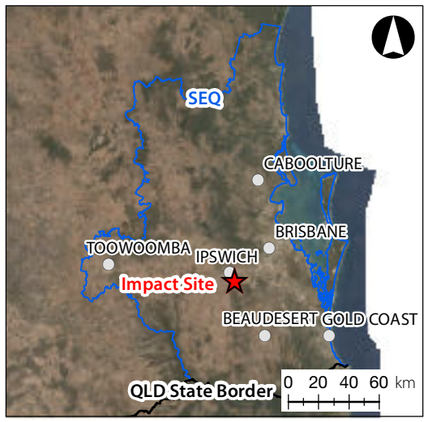
LEGEND

- Qld DCDB
- Referral Area

Statewide Corridors

- Regional Significance
- State Significance



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HB QLD PTY LTD

BINNIES ROAD, RIPLEY

0 300 600 m

Transverse Mercator
GDA 2020 | Zone 56

N

1:30,000
@ A3

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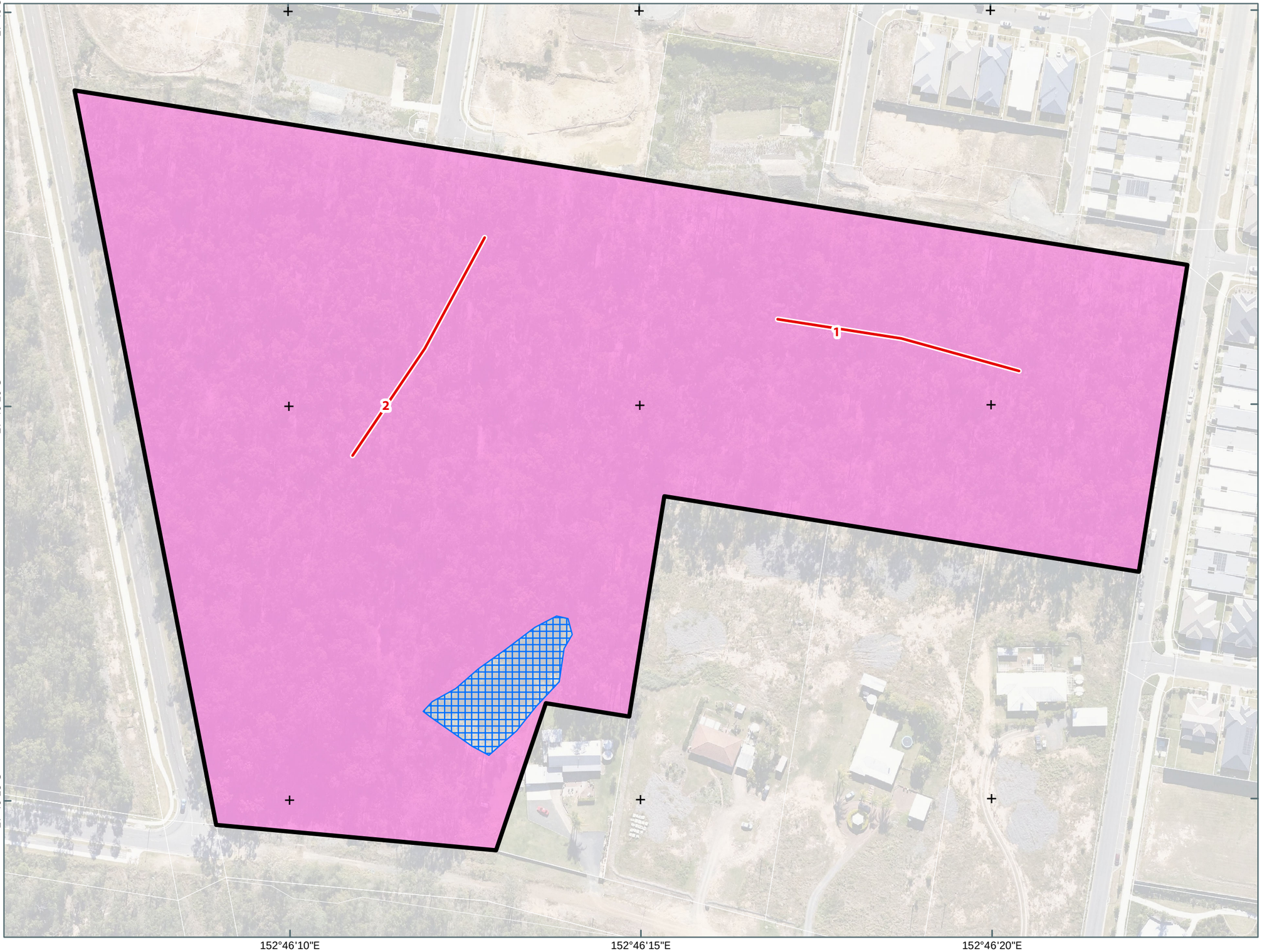
8/07/2025

11826 E A17 Eco Corridors A_

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



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Layer Sources

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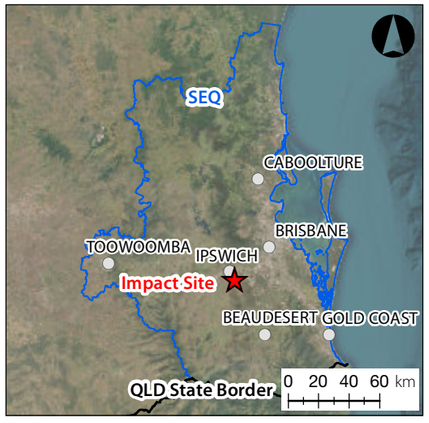
LEGEND

- 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

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N

1:1,500 @ A3

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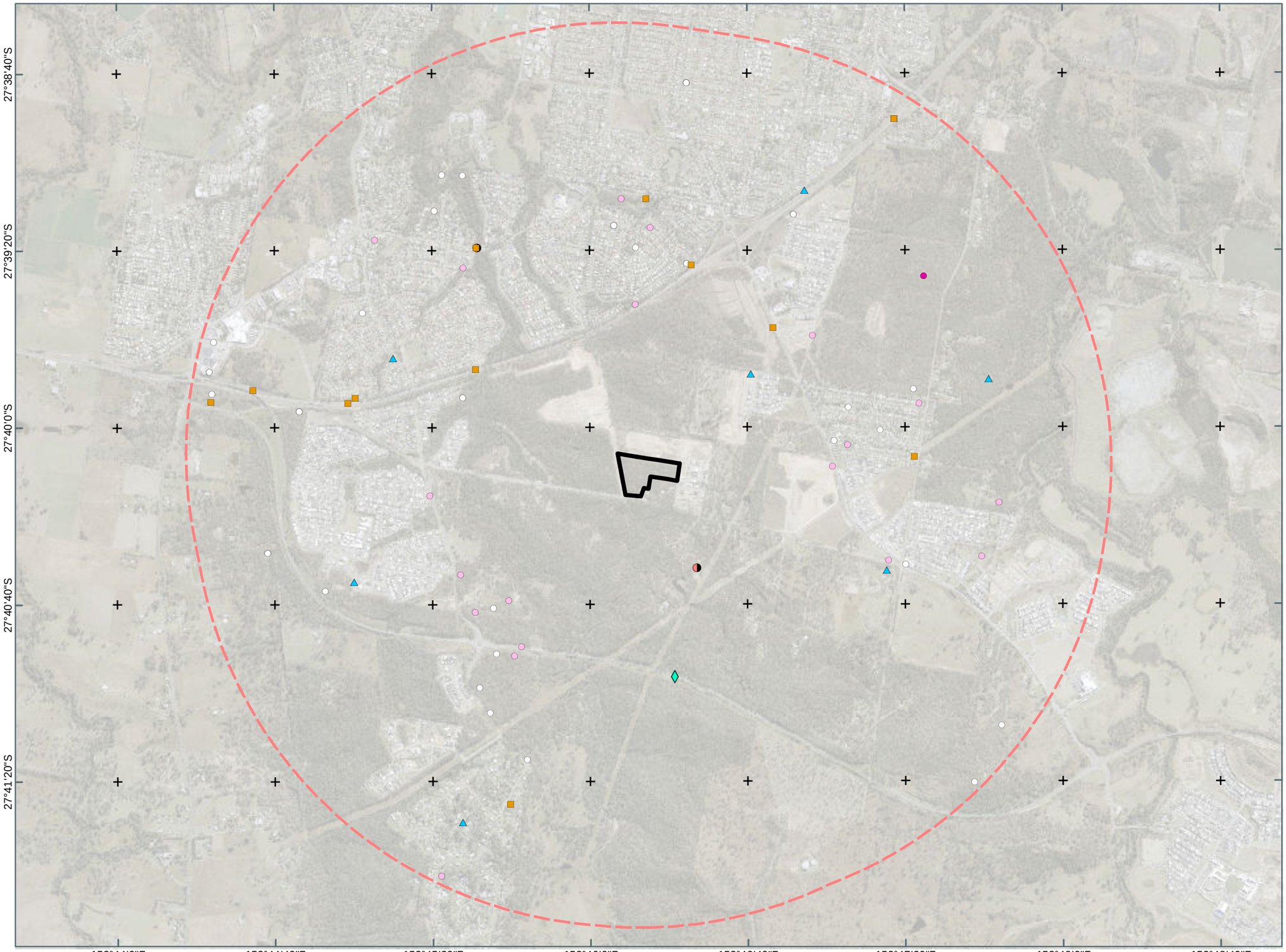
17/02/2026

11826 E A18 Koala Impact B

A19. KOALA HOSPITAL RECORDS



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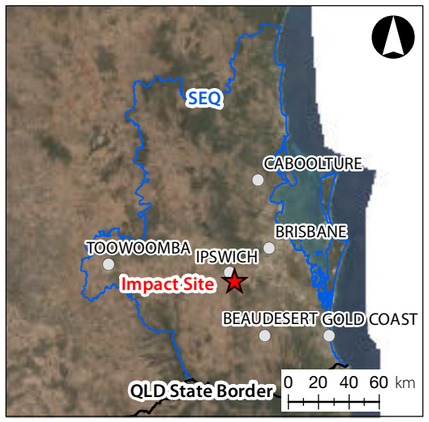
LEGEND

- 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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0 300 600 m
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11826 E A19 Koala Hospital A_

A20. HOLLOW BEARING TREES

Notes:
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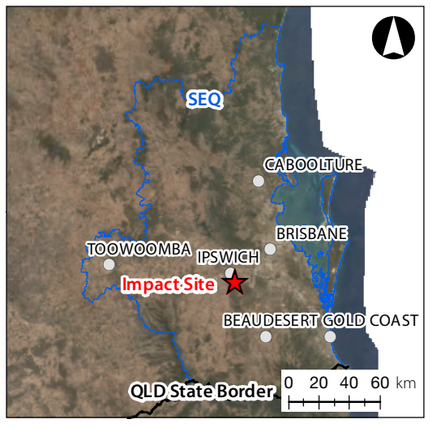
LEGEND

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



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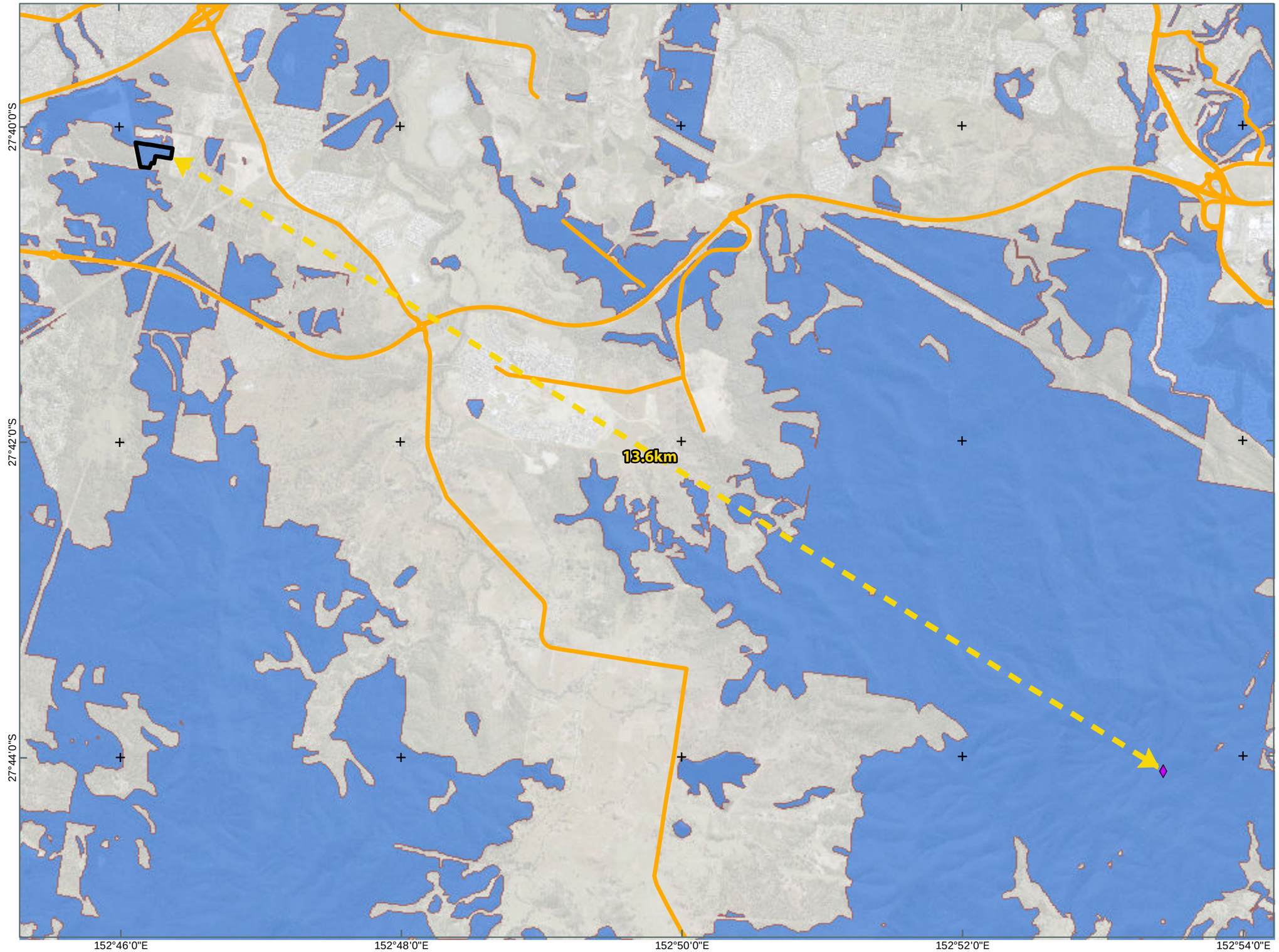
1:1,500 @ A3

Address / RPD: *Lot 335 on RP814578*

16/12/2025

11826 E A20 GG Impact A

A21. GREATER GLIDER RECORD DISTANCE



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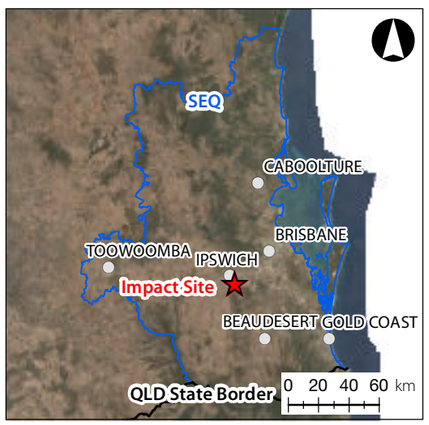
LEGEND

- 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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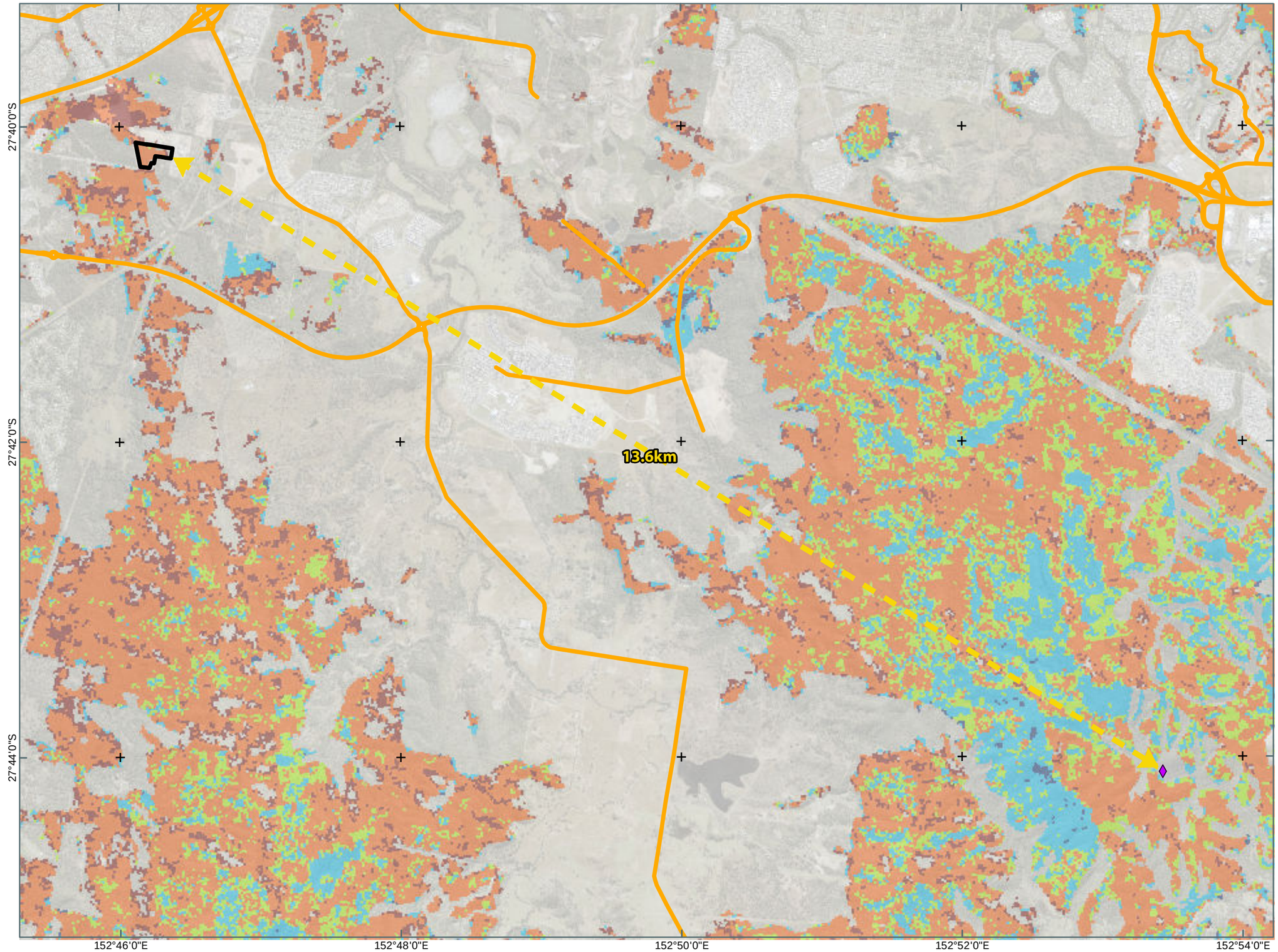
Address / RPD: *Lot 335 on RP814578*

8/07/2025

11826 E A21 GG Distance A_

A22. FOREST MATURITY TYPE MAP (GRIFFITH UNIVERSITY)



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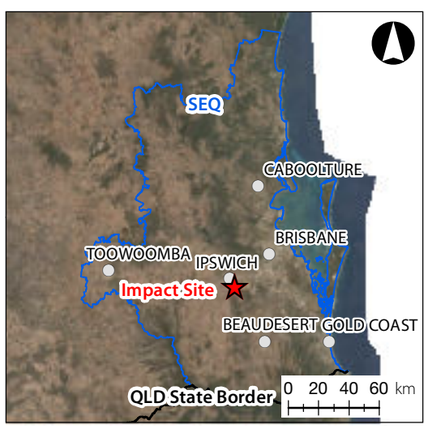
LEGEND

- 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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0 500 1,000 m
Transverse Mercator
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N
1:45,000
@ A3

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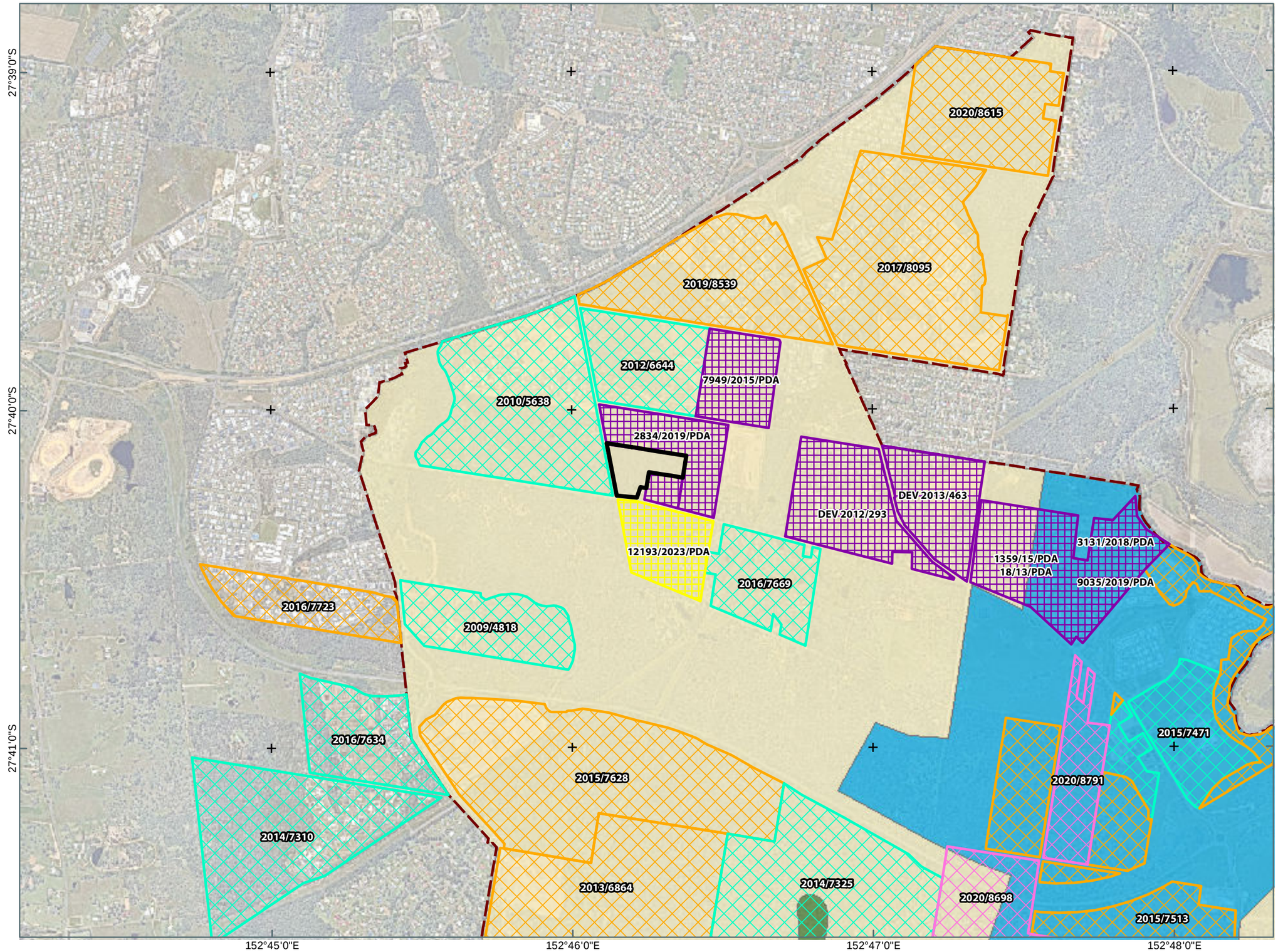
8/07/2025

11826 E A22 Forest Maturity A_

A23. ZONING AND APPROVALS



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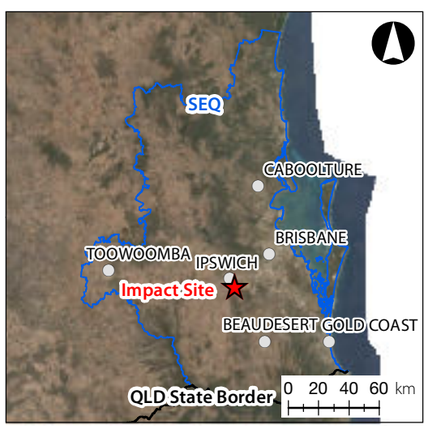
LEGEND

- 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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8/07/2025

11826 E A23 Zoning Approvals A_

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.

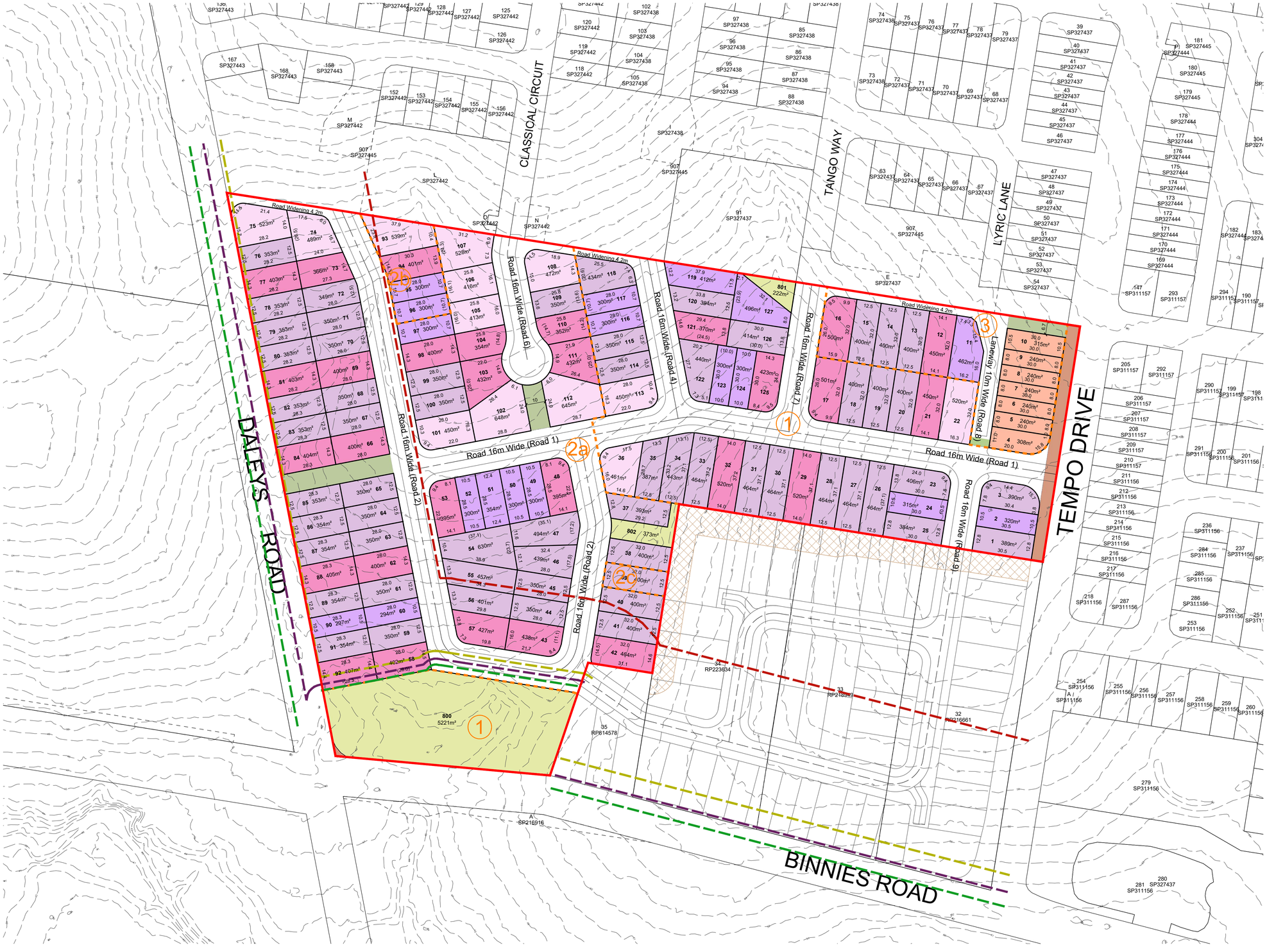
To support First Nations economic participation, we recommend proponents develop a First Nations employment, training and procurement plan incorporating participation targets. The Department of Infrastructure, Transport, Regional Development, Communications and the Arts' *Indigenous Employment and Supplier-use 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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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.

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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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

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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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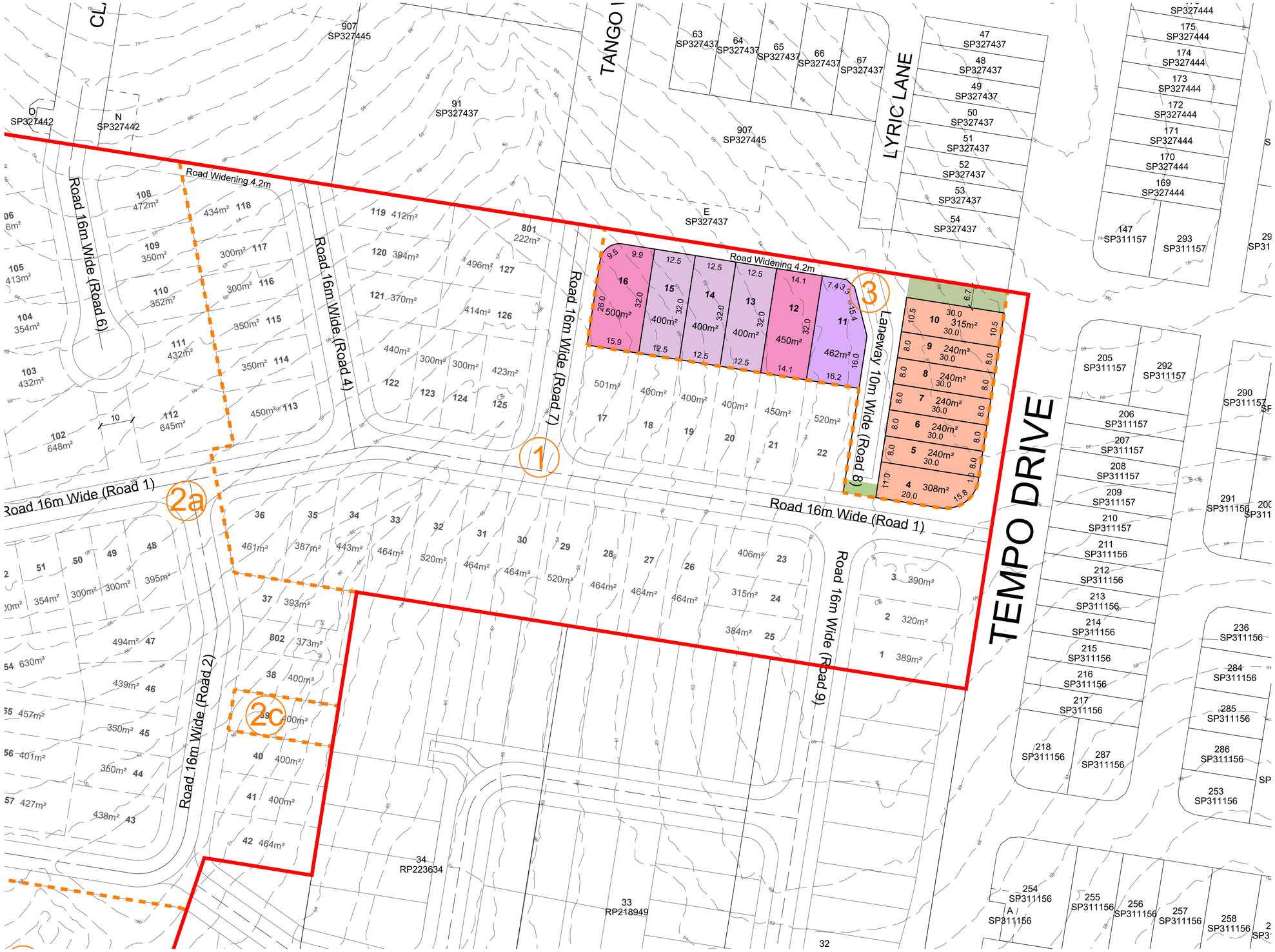
PROPOSAL PLAN - STAGE 3



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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 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

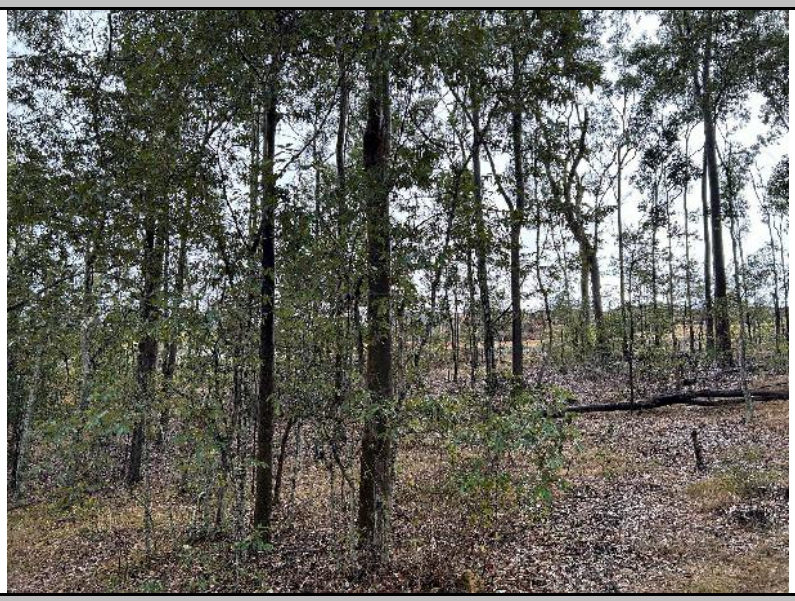
	59
	295

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