

Hayfield School Site, Fischer Road, Ripley
EPBC Ref: 2021/9070

Preliminary Documentation Report (PART A)

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

August 2026

Document Control

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Executive Summary

The referral area is located within the Ripley Valley Priority Development Area (RVPDA), an area undergoing rapid change and urbanisation, which is earmarked to continue into the future. The referral area adjoins Ripley Road Development (EPBC 2017/8095) to the west and CLAG Pty Ltd Ripley View Residential Subdivision (EPBC 2020/8615) to the north now approved. While properties to the north and west of the referral area remain largely vegetated, the adjoining properties to the north, south and west are located within the RVPDA zoned as Urban Living and at various stages of development. Rural residential properties located to the east across Fischer Road are located outside of the RVPDA and zoned Rural Constrained under the Ipswich Planning Scheme 2006.

Historically, a portion of the referral area has been subject to logging and thinning practices. Overall, vegetative cover is relatively intact though immature, and so limited habitat features, such as established hollows, were recorded.

The referral area is zoned as 'Urban Living' under the RVPDA Development Scheme and the proposed action has been guided on the intent of the development scheme. The proposed action is for the construction of education facilities. The proposed action is located within 19.1 ha of Lot 901 SP 317868 which requires all vegetation within the referral area to be cleared to deliver a level development pad to Education Queensland (refer to **Plan A1**).

The Protected Matters database search returned five (5) listed Threatened Ecological Communities (TEC), thirteen (13) flora species and twenty-three (23) fauna species protected under the *Environment Protection and Biodiversity Conservation Act 1999* as potential occurrences. Of these, only two (2) threatened fauna species were identified as likely occurrences following desktop analysis, being the Koala (*Phascolarctos cinereus*) and Grey-headed Flying-fox (*Pteropus poliocephalus*).

Field surveys did not observe Koala within or adjacent to the referral area, however, evidence of use was recorded in the form of scats. Recent Spot Assessment Technique (SAT) surveys conducted in conjunction with Modified Habitat Quality Assessments (MHQA) determined the site supported low Koala activity levels. No Grey-headed Flying-fox or any Flying-fox roosts were recorded within the referral area, with the nearest active camp being located approximately 3.28 km to the west.

The referral documentation (**Part B**) determined that all other MNES including the Greater Glider, Swift Parrot and Regent Honeyeater were a low likelihood of occurrence based on desktop analysis, however, remained target species throughout the survey period. Despite comprehensive field surveys, these species were not detected on or adjacent to the referral area and the highly disturbed and thinned fragmented habitat present is not considered suitable to support them. As such, the proposed action is not considered to have a significant impact on these species.

Field surveys confirmed evidence of the Koala within the referral area. Although the proposal has sought to avoid, minimise and mitigate impacts through avoidance of waterway corridors, the proposed action will

result in the clearing of vegetation identified by the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) as habitat critical to the survival of the Koala and foraging habitat for the Grey-headed Flying-fox.

The Department considers foraging habitat characteristics for the Grey-headed Flying-fox analogous with vegetation characteristics that provide critical habitat for the Koala. As such, an offset will be delivered in accordance with the *EPBC Act Environmental Offsets Policy 2012* to compensate for the unavoidable loss (direct and functional) of 19.1 ha of habitat critical to the survival of the Koala and foraging habitat for the Grey-headed Flying-fox.

Significant residual impacts will be compensated through land-based offsets in accordance with the *EPBC Act Environmental Offsets Policy 2012*. An Offset Management Plan (OMP) has been finalised and is included with this Preliminary Documentation package for assessment to ensure that the OMP adequately addresses the impact.

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Acronyms and Abbreviations

Legislation, Policies and Guidelines

EOP	EPBC Act Environmental Offset Policy (Cth)
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
NCA	<i>Nature Conservation Act 1992</i> (Qld)
SPP	State Planning Policy (Qld)
VMA	<i>Vegetation Management Act 1999</i> (Qld)
SEQRP	South East Queensland Regional Plan 2009 -2031

Government Departments

DAWE	Department of Agriculture, Water and the Environment (Cth, former)
DAF	Department of Agriculture and Fisheries (Qld)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth) (formerly DAWE)
DESI	Department of Environment, Science and Innovation (Qld)
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning (Qld)
EDQ	Economic Development Queensland (as part of DSDILGP)
EHP	Department of Environment and Heritage Protection (Qld) (currently DESI)
ICC	Ipswich City Council
DOR	Department of Resources (Qld)
DTMR	Department of Transport and Main Road (Qld)

General Terms

AU	Assessment Unit
EDQ	Economic Development Queensland
FHA	Foraging Habitat Assessment for the Grey-headed Flying-fox
FMP	Fauna Management Plan
KHAT	Koala Habitat Assessment Tool (as per the Koala Referral Guidelines)
KSAT	Koala Spot Assessment Technique Survey
MHQA	Modified Habitat Quality Assessment
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
OMP	Offset Management Plan
PD	Preliminary Documentation
PMST	Protected Matters Search Tool
RE	Regional Ecosystem
SAT	Spot Assessment Technique
SEQ	South-east Queensland
SHG	Saunders Havill Group
TEC	Threatened Ecological Community
VC&MP	Vegetation Clearing and Management Plan

Reference Documents

Code of Practice

Wildlife and Threatened Species Operations Branch, Department of Environment and Science (DES), Code of Practice – Care of Sick, Injured or Orphaned Protected Animals in Queensland, Nature Conservation Act 1992, August 2020.

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 (EOP)

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.

Koala Referral Guidelines

EPBC Act referral guidelines for the vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory, Commonwealth of Australia, 2014.

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 Group (SHG) act on behalf of Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust in the coordination and production of the response to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Controlled Action Determination assessment on Preliminary Documentation (PD) for the proposed land located at Fischer Road, Ripley (Lot 901 on SP317868), Queensland (EPBC Reference: 2021/9070).

On the 26 October 2021 a referral under the EPBC Act was made to the Commonwealth Department of Climate Change, Energy, the Environment and Water (the Department), formerly the Department of Agriculture, Water and the Environment (DAWE), for a controlled action assessment. On the 25 November 2021 this application was deemed a Controlled Action requiring assessment by "Preliminary Documentation" (refer **Attachment A1**).

The Controlled Action decision was based on the determination of potential impacts 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 Vulnerable at the time of the referral, and
 - Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable.

It is acknowledged that the referral application, which included an assessment of the proposed action against the applicable EPBC Act guidelines and policies, including the Significant Impact Guidelines 1.1, determined the proposed action was unlikely to have a significant impact on MNES. Residual impacts can be appropriately managed as part of the proposed action to mitigate impacts of MNES (refer to **Part B** for a copy of the original Referral Application).

With the November 2021 controlled action determination, the Department provided a list of additional information required to be addressed within the Preliminary Documentation (PD) report. A copy of this PD additional information request is included as **Attachment A2** and each item has been extracted as each subsequent chapter of this PD. As part of this assessment processes, the PD must be published for public comment.

The purpose of this report is to provide additional information to the Department to accompany the PD assessment process to ultimately obtain formal approval for the Proposed Action.

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**

Part A: Preliminary Documentation refers to this document. Part A includes relevant figures, plans and supporting material required to support full assessment of the action by the Department. These have been referenced with the prefix A (i.e., Figure A1, Plan A1, Attachment A1). Figures and Plans have been provided in **Section 13** and Attachments in **Section 14** at the back of the PD for ease of reference. Refer to the front of this document for a full table of contents and list of attachments.

The following sections within this 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 1: Introduction
- Section 2: Description of the action
- Section 3: Description of the environment and Matters of National Environmental Significance
- Section 4: Quantification of Impacts
- Section 5: Avoidance and Mitigation
- Section 6: Proposed Offsets
- Section 7: Habitat Quality Assessment
- Section 8: Economic and Social Matters
- Section 9: Ecological Sustainable Development
- Section 910: 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, in full, prepared by technical consultants in preparation for this PD. Relevant sections from each of these documents have been brought forward and incorporated into Part A of the PD for ease of reference and readability. It is noted that changes to the referral material are not possible and Part A of the PD supersedes the information in the referral.

1.1 Reference Table

This section provides a reference table indicating report chapters that correspond with items requested within the additional information request included as **Attachment A2**. Each item has been extracted and provided within the corresponding chapter of this PD.

Table A1: Reference Table

Item	Description	Corresponding Section
1. General Content, Format and Style		
1.1	Include a reference table indicating where to find the information fulfilling this request.	Table A1
1.2	Contain sufficient information to allow the Minister (or delegate) to make an informed decision on whether or not to approve, under Part 9 of the <i>Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)</i>, the undertaking 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).	1-12
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, and describe and reference the methodology chosen; e) detail why the methodology/s was selected, and state any limitations in the chosen approach; f) are, where appropriate, supported by maps, plans, diagrams or other descriptive detail; g) demonstrate consideration of relevant documents* including Approved Listing Advice(s), Approved Conservation Advice(s), Recovery Plan(s), Threat Abatement Plan(s) or comparable policy guidelines, and approved survey methods; and h) 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 Species Profile and Threats Database (SPRAT) and EPBC Act publications and resources.	
1.4	Must avoid passive language and use active, clear commitments (e.g. 'must' and 'will') where appropriate.	
1.5	Be able to read as a stand-alone document and must include summaries of all relevant information. Detailed technical information, studies or investigations necessary to support the main text should be attached as appendices to the main document.	

Item	Description	Corresponding Section
Note: Please note that the department may require further information, in addition to the information required below, should new information come to light during the assessment stage (e.g. additional species has been identified onsite).		
2. Description of the Action		
2.1	a) a description of all components of the proposed action (preparation, clearing and earthworks), including the anticipated start and completion dates and duration. This should include a detailed outline of the expected timing of any staged clearing.	2.1
	b) the location, boundaries, and size (in hectares) of the disturbance footprint, and of adjoining areas and vegetation, which may be indirectly impacted by the proposal, including from material stockpiles, vehicle access and associated activities, with accompanying maps*.	2.2
	c) a clear description of any material changes (e.g. total footprint, areas to be cleared) or planning changes between the referral and draft preliminary documentation submissions.	2.3
	d) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies to the proposed action, or that the proponent reasonably believes are likely to apply, to the proposed action.	2.4
	e) information on a buffer zone between the construction footprint area and adjacent environment.	2.5
	* The department's 'Guide to providing maps and boundary data for EPBC Act project s' provides guidance on how to prepare and provide spatial information (maps and data) for each stage of the EPBC Act assessment process.	
2.2	Further information is required as follows:	2.6
	a) a description with supporting figures detailing all site access roads and any other shared infrastructure to be constructed to facilitate the proposed action.	
	b) mapped locations and size of any proposed fire breaks, and details of any proposed new or updated fire management plans as a result of the proposed action.	2.7
	c) information about proposed fencing, including:	2.8
	- the location of all proposed fencing - the characteristics of the fencing, i.e. height, length, wildlife proof measures etc; - whether the proposed fencing will provide a wildlife barrier to/from/within the proposed action area; and	

Item	Description	Corresponding Section
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- please support with maps, plans, diagrams whenever possible.

3. Description of the environment and MNES

Listed threatened species and ecological communities and listed migratory species

From the information provided to date, the department considers that the matters that may or are likely to be significantly impacted by the proposed action include, but are not limited to:

- Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) – vulnerable
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable.

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 will or are likely to be significantly impacted by the proposed action, are assessed for the Minister's consideration.

It is also the responsibility of the proponent to maintain awareness of any changes to species distributions. Please ensure that a recent Protected Matters Search Tool report is generated and used during the assessment before finalising the draft preliminary documentation.

Habitat assessments

Habitat assessments must be informed by desktop and field surveys in accordance with relevant departmental documents (e.g. approved Conservation Advices, Recovery Plans, draft referral guidelines and Listing Advices, and SPRAT Database), including published research and other relevant sources.

The department does not accept assessments of impacts based only on the use of Queensland Regional Ecosystem (RE) mapping to determine habitat for listed threatened species – habitat assessments must consider and align with the information in the SPRAT Database and relevant departmental documents.

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.

3.1	A description of any potential Matters of National Environmental Significance (MNES) that occur in the project area and adjacent areas.	3.1
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Item	Description	Corresponding Section
3.2	A description and map/s of the current land use, land topography, surface and ground water bodies, waterways and vegetation communities (habitat types as they relate to the above listed threatened species) on the proposed action area and adjoining areas.	3.2
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, this section must provide the following:	3.3
	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). c) Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas. d) Information about known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations. e) Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days). f) An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. g) Results of any surveys undertaken. Note: Survey data should be as recent as possible and collected in the last five years. If adequate surveys are not undertaken, it may be appropriate to assume that those listed species and ecological communities are present at the proposed site.	3.3.1-3.3.2

4. Assessment of impacts

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 that:

- due to the presence of both food and auxiliary tree species of importance to the Koala, the proposed action would directly impact the Koala through the clearing of 19.1 ha of habitat considered critical to the survival of the species.
- the proposed action is also likely to have indirect impacts on the Koala in surrounding areas, such as from noise and light disturbance, increased edge effects, increased vehicle

Item	Description	Corresponding Section
	activity and introduction of domestic animals (e.g. dog attack).	
	- suitable winter and spring food trees for the Grey-headed Flying-fox are present on site. Winter and spring flowering food trees are considered habitat critical to the survival of the species as outlined in the National Recovery Plan for the Grey-headed Flying-fox '<i>Pteropus poliocephalus</i>'. - although no Grey-Headed Flying Fox were observed during surveys, the presence of suitable foraging habitat, as well as the proposed action site being within proximity of a camp site suggest that the species is likely to utilise the habitat on site from time-to-time. For these reasons, the proposed action is likely to have direct and indirect impacts on the Grey-headed Flying-fox.	
4.1	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.	4.1
4.2	Include current maps and coordinates/shapefile of the proposed impact area and areas of habitat for MNES proposed to be retained. 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.	12
4.3	Confirm the area of habitat that will be directly and indirectly impacted by the proposed action, including but not limited to areas where: a) Connectivity to surrounding habitat will be retained, removed or functionally lost. b) Adjacent habitat will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence).	4.3
4.4	Confirm the quantity and quality of suitable habitat to be impacted within the proposed action area.	4.4
4.5	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.	4.5
4.6	Provide an assessment of the direct and indirect impacts that may occur during construction and post-construction phases, including: a) The nature and extent of impacts (including direct, indirect* and facilitated impacts**), including timing and whether the impact is temporary or permanent. This must include the quality of the habitat impacted, a quantification of the total individuals/populations and habitat area in hectares and analysis of the indirect impacts such as fragmentation of the habitat in the proposed action area and surrounding areas. Consideration must be given to species habitat 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).	4.6

Item	Description	Corresponding Section
	b) A local and regional scale analysis of likely impacts, with reference to the project's potential contribution to cumulative impacts in the context of development patterns in the locality and region. c) An assessment of the likely duration of impacts to MNES as a result of the proposed action. d) An assessment of whether impacts are likely to be repeated, for example as part of maintenance. e) Discussion of the risk of potential impacts as a result of 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 preconstruction, clearing and earthwork phases. iii. Increased presence of dogs – pre-construction, clearing and earthwork 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 earthwork phase of the project. v. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during clearing and earthwork phases. <i>*Note: Please review the following policy statement, providing guidance on what impacts constitute a 'indirect consequence(s)', under paragraph 527E(1)(b) of the EPBC Act.</i> <i>**Note: 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 domestic pools.</i>	

5. Avoidance and mitigation measures

5.1	a. Provide a consolidated assessment of all proposed measures to avoid and mitigate impacts, including those provided in the referral and any additional to those described in the referral.	5.1.1
	b. Detail how all reasonable efforts have been made to avoid impacts to MNES, and that any remaining impacts are mitigated to reduce the impacts on MNES. Discussion of consideration and assessment of alternative strategies, plans and measures to avoid and mitigate impacts.	5.1.2
	c. Describe (including maps and imagery) the location, boundaries and size of buffer areas or proposed exclusion/retention areas, and details on how these areas will be enhanced, protected and maintained including a schedule of management actions and reporting. Also	5.1.3

Item	Description	Corresponding Section
	include a description of any fences or barriers which may be installed around areas where impacts will be avoided.	5.1.4
	d. Provide details of ongoing monitoring and analysis to inform adaptive management of retained habitat areas.	
	e. Provide an assessment of the expected or predicted effectiveness of the avoidance and mitigation measures for each MNES species/community, including the scale and intensity of impacts of the proposed action and the on ground benefits to be gained through each of these measures. Where an impact on a species/community is avoided, this should be stated.	5.1.5
	f. Provide details of any ongoing mitigation and management measures during the operation of the facility. This includes management of direct and indirect impacts for the Koala and other relevant MNES, due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by vehicles.	5.1.6
	g. Describe the proposed mitigation measures to be taken in accordance with requirements of the Queensland State government and local governments.	5.1.7
	h. Provide evidence of the effectiveness of each avoidance and mitigation measure discussed above, noting that the effectiveness of a particular measure is a reflection of the confidence in the ability of the measure to reduce the risk or threat. The assessment of the effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome.	5.1.8
	i. Clearly list the outcomes of the avoidance and mitigation measures, and follow the specific, measurable, achievable, relevant and timely (SMART) principle.	5.1.9
	j. Provide details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.	5.1.10
5.2	For each measure proposed; indicate the: a) Impacts to be avoided and/or mitigated b) Responsible party c) Environmental outcomes to be achieved d) Milestones / performance / completion criteria e) An evidence-based likelihood of success/ risk assessment f) Proposed monitoring and evaluation program g) Contingency measures	5.2
5.3	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	5.3

Item	Description	Corresponding Section
	with relevant plans.	
	For example, the Approved Conservation Advice for <i>Phascolarctos cinereus</i> (combined population of Queensland, New South Wales and the Australian Capital Territory) priority management action is to:	
	‘Develop and implement a development planning protocol to be used in areas of koala populations to prevent loss of important habitat, koala populations or connectivity options.’	
	Please provide a discussion on how the proposed action is consistent with the relevant species’ objectives or alternately, how the proposed avoidance, mitigation measures and offsetting will compensate for any residual significant impact, thereby ensuring consistency with the objective for relevant EPBC Act species.	

6. Proposed Offsets

Based on the referral information, the department considers that the proposed action is likely to have residual significant impact on 19.1 ha of Koala (*Phascolarctos cinereus*) and Grey-headed Flying-fox (*Pteropus poliocephalus*) habitat.

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 Environmental 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.

If a residual significant impact is identified, the preliminary documentation must include an offset proposal, which must:

- | | | |
|------------|--|---|
| 6.1 | <p>a) meets the principles outlined in the EPBC Environmental Offsets Policy.</p> <p>b) addresses the considerations and requirements outlined in the EPBC Environmental Offsets Policy, including but not limited to sections 6 and 7 of the EPBC Environmental Offsets Policy.</p> <p>c) directly contributes to the ongoing viability of the EPBC listed species or ecological community and will deliver an overall conservation outcome that improves or maintains the viability of the protected matter, as compared to what is likely to have occurred under the status</p> | 6 |
|------------|--|---|

Item	Description	Corresponding Section
	quo, i.e. if neither the action nor the offset had taken place.	
	d) compensates for the impact over the entire duration of the impact (i.e. should impacts be in perpetuity, the offsets must also be delivered in perpetuity).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.	

7. Habitat Quality Assessment

A methodology that is suitable for each listed threatened species or threatened ecological community (i.e. approved 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 currently prefers the use of the Modified Habitat Quality Assessment (MHQA) tool to provide a habitat quality score for the prescribed matters. Please consult the department if an alternative approach is proposed.

The MHQA tool derives habitat quality scores using an adaptation of the Queensland Government's 'Guide to determining terrestrial habitat quality version 1.2 (Department of Environment and Heritage Protection (Qld) (EHP) Guide). The MHQA method was developed with the intention to better reflect the requirements of the EPBC Act Environmental Offsets Policy for determining habitat quality.

A copy of the EHP Guide, a MHQA scoring guide and a MHQA scoring spreadsheet template is attached. When calculating offsets, please refer to the department's published guidance: How to use the Offsets Assessment Guide.

If applying the MHQA tool, please note the following:

- If you propose a habitat quality gain of more than 2 points, or an achieved habitat quality score of 9 or 10, it becomes less certain that the conservation outcome can be achieved. Justification of effectiveness of your proposed management measures and associated habitat quality score improvements must be supported by substantial evidence.
- Higher habitat quality gains will generally be associated with lower 'confidence in result' scores 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

Item	Description	Corresponding Section
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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 wish to propose an alternative methodology for habitat quality assessment for any/all of the prescribed matters, the methodology used to provide the quality score for an area of habitat must:

- relate directly to habitat requirements of the species as aligned with the information in the SPRAT database and relevant departmental documents.
- be substantiated with appropriate field surveys in accordance with the relevant survey guidelines or using a scientifically robust and repeatable methodology.
- be applied per listed threatened species or threatened ecological community likely to experience a significant residual impact as a result of the proposed action.

Where there is any variation or un-substantiation of the habitat assessment approach from the information available in the SPRAT database, it should 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.	8.1
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.	8.2
8.3	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.	8.3
8.4	Provide details of any consultation with Indigenous stakeholders.	8.4
	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.	

Item	Description	Corresponding Section
	Advise if any indigenous heritage surveys or assessments of the area have been previously undertaken as part of earlier works. If surveys have been previously undertaken, please make these surveys or assessments available and provide a summary of findings to the department as part of the assessment documentation. Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. This should include: • 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. • 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 Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act (2016) includes: • identifying and acknowledging all relevant affected Indigenous peoples and communities; • committing to early engagement; • building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management; • setting appropriate timeframes for consultation; and • demonstrating cultural awareness.	

Item	Description	Corresponding Section
	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		
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. More information on ESD in the Criteria for Determining ESD Relevance.	9
10. Environmental record of the person proposing to take the action		
Include details of any adverse findings 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
10.2	For an action for which a person has applied for a permit, the person making the application;	
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 provided with this request for additional information. 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.		

1.1. Site Description and Details

Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust ('the Proponent') seeks to clear vegetation and undertake earthworks in preparation for the construction of a school on land located at Fischer Road, Ripley, legally described as part of Lot 901 on SP317868. The referral area is located within the Ripley Valley Priority Development Area (RVPDA), an area undergoing rapid change and urbanisation, which is earmarked to continue into the future. The referral area is shown as **Figure A1** and **Figure A2**. For ease of reading, all referenced Figures and Plans are provided as Attachments to Part A. Key site details are presented in **Table A2**.

The referral area is located within Ipswich City Council Local Government Area, however, is situated within the RVPDA and subsequently administered by the Queensland Government Department, Economic Development Queensland (EDQ) which is the key regulator of development within Priority Development Areas. As such, EDQ have jurisdiction for the implementation and enforcement of development applications in relation to the referral site. Ipswich City Council complete the assessments on behalf of EDQ.

The project has received a whole of site Material Change of Use (MCU) for Residential and Recreational Uses, approved under the Economic Development Act 2012 (Application Number 34/2015/MAPDA/B). Under that approval, the proponent is required to provide Infrastructure Master Plans and Overarching Site Strategies. The overarching site strategies will introduce compliance assessment at operational works to ensure that the objectives of each site strategy are met. These will include flora, fauna, water and natural environment management controls that are designed to mitigate the potential for adverse impacts.

Therefore, the planning intent of the site is demonstrated to be in line within the Ripley Valley Priority Development Area Development Scheme. The proposal has been guided on both the intent of the development scheme and physical constraints informed by technical consultants reporting.

Table A2: Referral Property Details

Address	Fischer Road, Ripley, Queensland, 4306
RPD	Part of Lot 901 on SP317868
Property Area	19.1 ha
Protected Plants	High Risk Area
VMA 1999	• PMAV (2005/101543) • Category X (non-remnant) • Category B (Remnant) – Of Concern Composite RE 12.9-10.2/12.9-10.7/12.9-10.16 (70/25/5), Least Concern RE 12.9-10.2 and Endangered RE 12.3.3 • Essential Habitat (Koala, Australian Painted Snipe and <i>Coleus habrophyllus</i>)
Fisheries 1994	No mapped waterways located within the referral area
MSES	• Wildlife Habitat (Endangered or vulnerable)

	• Wildlife Habitat (Koala habitat areas – core) • Regulated vegetation (Category B) • Regulated vegetation (essential habitat) • Regulated Vegetation (intersecting a Watercourse)
Koala Habitat	Core Koala Habitat Area (not within Koala Priority Area)
LGA	Ipswich City Council
Planning Scheme / Local Plan	Ipswich City Council Planning Scheme / Ripley Valley Priority Development Area Scheme
PDA	Ripley Valley Priority Development Area • Zone – Urban Living
Existing Land Use	Vacant Land
Proposed Land Use	Community Facilities (Education Purposes)

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, including:

2.1 Description of the proposed action

Item 2.1 (a) of the PD Request asks for ***“a description of all components of the proposed action (preparation, clearing and earthworks), including the anticipated start and completion dates and duration. This should include a detailed outline of the expected timing of any staged clearing”.***

Subject to the EPBC Act controlled action approval process, construction is planned to commence in June 2025 with an estimated end date of December 2025.

The proposed action, as undertaken by the Proponent, will include the clearing and earthworks of the 19.1 ha referral area. Responsibility will transfer to Education Queensland following completion of earthworks and delivery of the development pad. A Preliminary Vegetation Clearing and Fauna Management Plan based on indicative earthworks is provided at **Attachment A3**.

2.2 The location, boundaries and size of the impact

Item 2.1(b) of the PD Request asks for ***“the location, boundaries, and size (in hectares) of the disturbance footprint, and of adjoining areas and vegetation, which may be indirectly impacted by the proposal, including material stockpiles, vehicle access and associated activities with accompanying maps”.***

Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust (‘the Proponent’) seeks to develop a school located at Fischer Road, Ripley, legally described as part of Lot 901 on SP317868. The action requires the removal of all vegetation within the impact area (refer to **Plan A1**). An EPBC Referral (EPBC 2017/8095) has been lodged for the remainder of Lot 901 on SP317868, where vegetation is proposed to be retained as open space within the waterway and associated endangered vegetation. The proposed action will adjoin the neighbouring open space area.

The following provides details on the impact area:

Table A3: Referral Area details

Address	Fischer Road, Ripley, Queensland, 4306
RPD	Lot 901 on SP317868
Referral Area	19.1 ha
Development Zone	19.1 ha

The proposed action aims to complement existing and future development within RVPDA that will ultimately provide education facilities to people in one of the fastest growing regions of Australia. As such,

the referral area is surrounded by a number of existing approvals and assessments including the approved Ripley Road Residential Development (EPBC 2017/8095) located west of the referral area and Ripley View Residential Development to the north (EPBC 202/8615, refer **Plan A2**).

The referral area is located within the Ripley portion of Ipswich Council, Queensland, approximately 30.7 kilometres south-west of Brisbane's CBD and situated within South East Queensland's (SEQ) south-west growth corridor (refer **Figure A1**). SEQ's south-west growth corridor is one of the largest job and industry growth areas in Australia and offers opportunities to accommodate significant levels of residential and employment growth.

Ripley is mapped as a major expansion area under the *Shaping SEQ – South East Queensland Regional Plan 2017*. Further, Ripley Valley is identified under the *South East Queensland Regional Plan 2009 -2031* (SEQRP) as a Regional Development Area. The regional plan identifies a need for an additional 118,000 dwellings in the Ipswich local government area by 2031. Ripley Valley has the potential to contribute approximately 50,000 dwellings to house a population of approximately 120,000 people. Ripley Valley will be a rich and festive community which has developed as a series of distinctive neighbourhoods and smaller villages. 'The valley' will be complimented by a network of smaller neighbourhood mixed use villages offering meeting places, cultural experience, shopping, recreation and state of the art transport connections near and afar.

Under the provisions of the *Ripley Valley Urban Development Area Development Scheme*, guidelines are set out for proposed developments to deliver suitably designed 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 site currently remains vacant, primarily vegetated land (refer **Figure A2**). Vegetation across the site is predominately of remnant regional ecosystems. Ecological values have been provided at all key design junctures in the development noting planning intent is as per the '*Ripley Valley Priority Development Area Development Scheme*' ('Development Scheme'). The proposal includes the development of approximately 19.1 ha. As the proposed action will result in the clearing of vegetation identified as critical habitat for the Koala and foraging habitat for the Grey-headed Flying-fox, an offset will be delivered in accordance with the *EPBC Act Environmental Offsets Policy 2012*.

The clearing of site habitat including vehicular movements and associated protection fencing will be governed by the Vegetation Clearing and Fauna Management Plan (**Attachment A3**). Material stockpiling and vehicular movements and construction activities post-clearing will be managed and mitigated under a Construction Management Plan (refer **Sections 5.1.6** and **5.1.10**).

2.3 Proposed Material or Planning Changes

Item 2.1(c) of the PD Request asks for "**A clear description of any material changes (e.g. total footprint, areas to be cleared) or planning changes between the referral and draft preliminary documentation submissions**".

As discussed above, the project has received a whole of site MCU. No changes have been made between the submission of the referral and preparation of this draft PD.

2.4 Applicable Planning Schemes and Plans

Item 2.1(d) 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 to the proposed action, or that the proponent reasonably believes are likely to apply, to the proposed action.”***

As discussed in **Section 1.2**, the proposed action is located within the RVPDA and is subject to the Ripley Valley Urban Development Area Development Scheme. Ipswich City Council (ICC) is the assessment delegate on behalf of EDQ.

The project has received a whole of site MCU for Residential and Recreation Uses, approval under the *Economic Development Act 2012* (Application Number 34/2015/MAPDA/B). Under the approval, the proponent is required to provide Infrastructure Master Plans and Overarching Site Strategies, including amongst many others the following environmentally specific site strategies:

- Natural Environment Overarching Site Strategy
- Ecological Sustainability and Innovation Overarching Site Strategy
- Total Water Cycle Management Overarching Site Strategy

Each overarching site strategy must:

- Be for the whole of the site
- Offer demonstration projects and other initiatives to respond to the requirements and standards, implementation strategies, stretch targets and goals outlined in the development scheme in force at the date of the approval and the guideline(s) in effect at the date of the approval.
- Identify opportunities for innovation.
- Include methodologies and undertakings for monitoring and reporting on the achievement of the overarching site strategy initiatives / outcomes, and
- Include any additional details or requirements set out in a relevant condition of this Approval.

Each overarching site strategy has been assessed against:

- The provisions of the development scheme in force at the date of the approval.
- The applicable guideline(s) in effect at the date of the approval, and
- Any further requirements set out in a condition of the approval.
- An endorsed overarching site strategy may be replaced by submitting for compliance assessment a new overarching site strategy for endorsement.

The overarching site strategies will introduce compliance assessment at operational works to ensure that the objectives of each site strategy are met. These will include flora, fauna, water and natural environment management controls that are designed to mitigate the potential for adverse impacts.

In addition to the above, the referral area is identified as a high-risk area within the flora survey trigger map administered under Queensland's *Nature Conservation Act 1992* (NCA). The flora survey trigger map identifies high-risk areas where critically endangered, endangered, vulnerable or near threatened native plants are likely to be present. High-risk areas are required to be surveyed in accordance with the Flora Survey Guidelines – Protected Plants (DES, 2020). Following the completion of surveys either a Protected Plant Exemption or Protected Plant Clearing Permit is required by the applicant and granted by DES. A Protected Plant Exemption is valid for 3 years following the date of the survey and a Protected Plant Clearing Permit is granted for a maximum of 2 years from the date of issue.

2.5 Buffer Areas

Item 2.1(e) of the PD Request asks for **“Information on a buffer zone between the construction footprint area and adjacent environment”**.

The proposed action will require the removal of all vegetation within the referral area. The final development layout is yet to be confirmed. To analyse impacts, a detailed Vegetation Clearing and Fauna Management Plan is not yet possible to compile given it is typically an operational works document based on detailed design that is not yet available, however, a preliminary version based on indicative earthworks is provided in **Attachment A3**. Notably and as depicted in **Attachment A3**, the action is not proposed to impact on adjacent environmental areas associated with the adjoining approvals.

2.6 Proposed Infrastructure

Item 2.2 (a) of the PD Request asks for **“A description with supporting figures detailing all site access roads and any other shared infrastructure to be constructed to facilitate the proposed action.”**

The proponent is undertaking the action on behalf of the Queensland Department of Education. Even though the final layout is yet to be confirmed by the Department, there are requirements by the Department on the delivery and handover of the school site which is to be completed by the proponent. Site requirements for the school include generally flat area, must be serviced or the ability to be connected to infrastructures (water, sewer, electrical and telecommunications) and must be serviced by a minimum of 2 road frontages.

With this, the scope of works to ensure school site requirements can be fulfilled includes:

- Clearing and grubbing
- Bulk earthworks (one metre cut to fill allowance) and grassing suitable for the site purposes
- Provision of service connections including potable water, sewerage, telephony, broadband, stormwater, and electricity

- Construction of a Neighbourhood Access Road cross section which will be one of the school road frontage, including a 2.5 m wide pathway.
- Provision of up to 2 bus bays
- Safety fencing in the road reserve, if required up to a length of 300m

2.7 Fire Management

Item 2.2 (b) of the PD Request asks for ***“mapped locations and size of any proposed fire breaks, and details of any proposed new or updated fire management plans as a result of the proposed action.”***

The surrounding area is not recognised as a bushfire hazard. Additionally, the entirety of the referral area is proposed to be cleared as required to deliver the school site to Education Queensland. At this point the school has not been designed noting the external periphery would typically be kept clear of infrastructure to allow ongoing site maintenance. The school will require a fire management plan for its operational phase, so this is not yet available.

The Department Of Education QLD will need to adhere to all standard Queensland bushfire risk mitigation requirements for building standards, including those imposed by EDQ under PDA assessment for project delivery. Their proposal will need to be cognisant of existing bushfire threats and be designed within the confines of the handover land accordingly.

In addition, fire risk management requirements within the Construction Environmental Management Plan (CEMP) will need to focus on hazard identification, ignition prevention, fuel management, and emergency response. Compliance will align with AS 3959 guidelines for bushfire-prone areas and PDA approval requirements.

2.8 Proposed Fencing

Item 2.2 (c) of the PD Request asks for ***“Information about proposed fencing, including:***

- ***the location of all proposed fencing;***
- ***the characteristics of the fencing, i.e. height, length, wildlife proof measures etc;***
- ***whether the proposed fencing will provide a wildlife barrier to/from/within the proposed action area; and***
- ***please support with maps, plans, diagrams whenever possible.”***

The proposed action requires fencing to be erected around the referral area boundary for school security purposes (**Plan A1**). Proposed fencing will be installed by and comply with the requirements of Education Queensland.

3 Description of the Environment and Matters of National Environmental Significance

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.’***

3.1 Description of Environment

Item 3.1 of the PD Request requires ***“a description of any potential Matters of National Environmental Significance (MNES) that occur in the project area and adjacent areas”***.

The referral area is comprised of remnant vegetation that has been subject to historical modification. Areas previously subjected to disturbances therefore provide comparatively limited MNES values including availability and quality of habitat for threatened flora and fauna (refer **Figure A2**). As discussed in **Section 1.2**, the referral area is located within the RVPDA, which is currently undergoing rapid change and urbanisation in accordance with the RVPDA Development Scheme administered by EDQ. Site context and surrounding land uses are discussed further in **Section 3.2.1**.

An EPBC Act Protected Matters Search for the site using a 5 km radius identified the following as having potential to occur on, or in vicinity to, the site:

- Five (5) listed Threatened Ecological Communities (TEC):
 1. Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community (Endangered) – community may occur within area.
 2. Lowland Rainforest of Subtropical Australia (Critically Endangered) - community may occur within the area.
 3. Poplar Box Grassy Woodland on Alluvials Plains (Endangered) – community may occur within area.
 4. Swamp Tea-tree (*Melaleuca irbyana*) Forest of South East Queensland (Critically Endangered) – community likely to occur within area.
 5. White Box-Yellow Box-Blakely’s Gum Grassy Woodland and Derived Native Grassland (Critically Endangered) - community may occur within area.
- Thirteen (13) listed threatened flora species.
- Twenty-three (23) listed threatened fauna species.

A likelihood of occurrence and risk of impact on the identified matters was undertaken and are discussed separately in the following sub-sections. Marine species were disregarded as part of this assessment given the lack of aquatic and/or marine habitat available on site and distance from marine areas.

3.1.1 Threatened Ecological Communities

Desktop Review

The Protected Matters Report (refer to **Part B**) returned five (5) threatened ecological communities (TECs), protected under the EPBC Act, as having potential to occur within 5 km of the referral area. A desktop Likelihood of Occurrence Assessment concluded that each of the identified TECs was 'unlikely' to occur within the referral area, supported by Queensland's *Vegetation Management Act 1999* Vegetation management supporting mapping.

Field Survey Results

Field surveys did not identify the above listed TECs within the referral area during field surveys.

3.1.2 Threatened Flora Species

Desktop Review

The Protected Matters Report returned thirteen (13) flora species, protected under the EPBC Act, found to potentially occur within 5 km of the referral area. The Vegetation Management Report issues by Queensland's Department of Resources maps the site as containing Essential Habitat for *Coleus habrophyllus* which is listed as *Plectranthus habrophyllus* under the EPBC Act.

However, extensive surveys have been completed for the adjacent project to the west, (EPBC 2017/8905), which included the proposed Hayfield School referral area, for both Matters of National Environmental Significance. Further, Protected Plant Flora Surveys were completed across the balance of the allotment, including the Hayfield School Site due to the 'High-Risk' areas being mapped on-site by the flora survey trigger mapping administered by the Department of Environment and Science (DES).

These Protected Plant Surveys did not identify any Endangered, Vulnerable or Near Threatened Plants, including *Coleus habrophyllus* on-site, in both the adjacent development and Hayfield School referral area.

The Likelihood of Occurrence Assessment determined that all of these species were unlikely to occur within the referral area based on the desktop assessment (refer to **Part B** for Likelihood of Occurrence Assessment).

Field Survey Results

Contemporary surveys to support the Preliminary Documentation Report did not identify any additional species that weren't detected during the Protected Plant Surveys, or habitat requirements to support threatened Flora. No EPBC Act listed flora species were identified during field surveys or are expected to occur.

3.1.3 Threatened Fauna Species

Desktop Review

At the time of referral, the PMST returned twenty-three (23) fauna species protected under the EPBC Act, found to potentially occur within 5 km of the referral area. The Likelihood of Occurrence assessment determined only four (4) fauna species as potential occurrences for further investigations.

Further, the site is mapped as containing Essential Habitat for *Rostratula australis* (Australian Painted Snipe). The species has been recorded to the east within the suburb of Swanbank and to the south east at Bundamba Lagoon. It was determined the species was unlikely to occur at the time of the referral due to the lack of suitable habitat within the referral area, but for consistency the Likelihood of Occurrence Table has been updated to included due to the proximity of records nearby.

The Guide to Greater Glider habitat in Queensland (DES 2022) provided more detail in potential habitat and habitat requirements for Greater Glider in Queensland, which coincided with the uplisting of Greater Gliders from Vulnerable to Endangered. Greater Glider habitat in Queensland includes Regional Ecosystems with confirmed Greater Glider records and contains habitat attributes including hollow-bearing trees, feed trees, large trees and habitat connectivity throughout the landscape. Regional Ecosystem 12.9-10.2 across South East Queensland has recorded Greater Gliders using the vegetation.

All other threatened and/or migratory fauna species were assessed as being 'unlikely' to occur. All species considered to be potential occurrences or target species are outlined in **Table A4**.

Table A4: Desktop assessment of threatened fauna species likelihood of occurrence.

Scientific Names	Common Name	Description of Community / Habitat	Desktop Assessment
<i>Anthochaera phrygia</i>	Regent Honeyeater	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. Key tree and mistletoe species for the Regent Honeyeater as identified in the National Recovery Plan includes: • <i>Eucalyptus sideroxylon</i> (Mugga (or Red) Ironbark) • <i>E. melliodora</i> (Yellow Box) • <i>E. albens</i> (White Box) • <i>E. leucoxylon</i> (Yellow Gum) • <i>Corymbia maculata</i> (Spotted Gum) • <i>E. robusta</i> (Swamp Mahogany) • <i>Amyema cambagei</i> (Needle-leaf Mistletoe) on <i>Casuarina cunninghamiana</i> (River Sheoak) • <i>A. miquelii</i> (Box Mistletoe) • <i>Dendrothoe vitellina</i> (Long-flower Mistletoe) In addition to the above listed species, <i>Eucalyptus tereticornis</i> (Forest Red Gum) and <i>Corymbia citriodora</i> (Spotted Gum) are considered preferred foraging species, particularly in South East Queensland.	Low / Potential The referral area is mapped entirely as Category B (remnant) vegetation under Queensland's Vegetation Management Act 1999. This includes primarily Least Concern Regional Ecosystem (RE) 12.9-10.2 with small areas of 'Of Concern' RE 12.9-10.7. The site is covered in remnant vegetation dominated by eucalypt and <i>Corymbia</i> species. The closest record of Regent Honeyeater is located 4.25km to the south along Bundamba Creek, demonstrated on ALA, however, this record has been generalised to 2km due to sensitivity concerns. Further, eBird maps the referral area with a 0-2% frequency for Regent Honeyeaters. There is a low potential that Regent Honeyeaters would regularly rely on the proposed impact site due to the scarcity of the species. The potential habitat for the species is further analysed following field work.
<i>Lathamus discolor</i>	Swift Parrot	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 / potential The referral area is mapped entirely as Category B (remnant) vegetation under Queensland's Vegetation

Scientific Names	Common Name	Description of Community / Habitat	Desktop Assessment
		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. Preferred foraging species in Queensland as identified in the National Recovery Plan include <i>Eucalyptus macrocarpa</i> (Grey Box), <i>Eucalyptus melliodora</i> (Yellow Box), <i>Eucalyptus robusta</i> (Swamp Mahogany) and <i>Eucalyptus tereticornis</i> (Forest Red Gum). In addition, <i>Corymbia citriodora</i> (Spotted Gum) and <i>Eucalyptus pilularis</i> (Blackbutt) are considered preferred foraging species.	Management Act 1999. This includes primarily Least Concern Regional Ecosystem (RE) 12.9-10.2 with small areas of 'Of Concern' RE 12.9-10.7. The closest record of Swift Parrot is located 6.9km to the south east along the Centenary Highway, demonstrated on ALA, however, this is dated from 1975 and has been generalised to 1.3km due to sensitivity concerns. More recently, Swift Parrots have been recorded approximately 12.5km to the east within the suburb of Springfield in 2019. However, eBird does not map the referral area within the range for the species. In addition, the National Recovery Plan for the Swift Parrot (<i>Lathamus discolor</i>) 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". Review of the Vegetation Management Act 1999 (VMA) Vegetation Management Report indicates that the referral area does not contain essential habitat for the Swift Parrot. Despite containing mapped potential foraging habitat, few records for the species have been made for the broader area. Due to the transient, nomadic nature of the Swift Parrot, it is unlikely the species would rely on the vegetation within the referral area. An assessment

Scientific Names	Common Name	Description of Community / Habitat	Desktop Assessment
<i>Rostratula australis</i>	Australian Painted Snipe	The Australian Painted Snipe is a cryptic wader species. Habitat for the species includes shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drains, generally with a good cover of grasses, rushes and reeds, low scrub, <i>Muehlenbeckia</i> spp. (lignum), open timber or samphire (Reader's Digest, 1997; Marchant and Higgins, 2003). The species is also known to be nomadic, with unpredictable movements.	of potential habitat values confirmed by field surveys will be discussed in following subsections. Low The site is not mapped as containing wetland mapping under the Vegetation Management Act 1999. A stream order 1 waterway is mapped to the west of the referral area. No waterways or wetlands are located in the referral area. It is considered unlikely Australian Painted Snipes would utilise the referral area due to the lack of suitable wetland habitat.
<i>Petauroides volans</i>	Greater Glider	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; <i>Corymbia citriodora</i>, <i>Eucalyptus moluccana</i>, <i>E. tereticornis</i>, <i>E. crebra</i>, <i>C. intermedia</i> and <i>E. portuensis</i>. Additionally, a list of 503 regional ecosystems with a known or possible association with Queensland 'Guide to Greater Glider Habitat in Queensland' (DES 2022). Habitat identified as critical habitat in the Conservation Advice for <i>Petauroides volans</i> (DCCEE, 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	Low / potential The referral area is mapped entirely as Category B (remnant) vegetation under Queensland's Vegetation Management Act 1999. This includes primarily Least Concern Regional Ecosystem (RE) 12.9-10.2 with small areas of 'Of Concern' RE 12.9-10.7. The site is covered in remnant vegetation dominated by eucalypt and <i>Corymbia</i> species. Hollow-bearing trees appear to be the most important factor determining habitat selection in southern Queensland as they are used for nesting, shelter and protection from predators and weather conditions. Although Greater Gliders have a relatively small home range, they are reported to be absent from forests with fewer than six habitat trees per hectare.

Scientific Names	Common Name	Description of Community / Habitat	Desktop Assessment
		- 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) that allow the species to persist, recover and recolonise burnt areas.	Fauna spotter catcher reports available from the broader Hayfield Estate, Trigona Drive (EPBC 2017/8095) demonstrate that Greater Gliders were not found during preclearance and services works for the vegetation clearing, and they are not expected to occur on site due to prevailing disturbance and historical thinning of trees.
<i>Phascolarctos cinereus</i>	Koala	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 species is known from the surrounding area. Koala food and habitat trees occur on site, and the site is comprised of predominately remnant vegetation, although that has been subject to historical modification.
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	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 and related genera.	Moderate The number of mature eucalypts and <i>Corymbia</i> trees occurring within the assessment area provide suitable foraging habitat throughout flowering periods. No roosting sites have been recorded within the referral area. The nearest active GHFF camp is located approximately 3.28 km west of the site being Yamanto (479). The GHFF is known to occur in the locality.

Field Survey Results

Following targeted field surveys, only two (2) of threatened fauna species, *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox) are considered to have potential to utilise the subject site as the species were either recorded onsite, with indirect activity records, or have a potential to utilise due to the relevance of records within the greater landscape. Suitable Koala habitat is present within the referral area in the form of eucalypt dominated remnant vegetation and Koalas have been known to occur within close proximity to the referral area. Evidence of Koala in the form of scats was recorded during field surveys.

The National Recovery Plan for the Grey-headed Flying-fox (DAWE 2021) lists critical habitat for the GHFF as:

- important winter and spring flowering vegetation communities that contain species listed in the recovery plan,
- contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)
- contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or
- contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp as identified on the Department's interactive flying-fox web viewer.

No individuals of this species were observed throughout the field surveys efforts. However, the site contains suitable foraging species, including species that are considered important winter and spring flowering resources. No roosting sites were observed within the referral area or in the vicinity of the site. The nearest active Grey-headed Flying-fox roost site located approximately 3.28 km west of the referral area.

The threatened fauna species Likelihood of Occurrence Assessment was updated to include ground-truthed information (refer to **Table A5**).

Table A5: Revised threatened fauna species likelihood of occurrence.

Species	Common Name	EPBC Status	Desktop Assessment	Field Assessment Confirmed Likelihood of Occurrence
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Potential	Unlikely Extensive field surveys were completed across the referral and wider allotment by numerous consultants. Despite these surveys, this species was not identified during field surveys. The site has been subject to historical modification, resulting in limited mature trees to provide suitable foraging species. Results of field surveys demonstrated that large trees in Assessment Unit 1 accounted for 37% compared to benchmark for Regional Ecosystem 12.9-10.2, further demonstrating a lack of preferred foraging species for the Regent Honeyeater. Mistletoe, an important food source for Regent Honeyeaters, was also not recorded within the referral area.

Species	Common Name	EPBC Status	Desktop Assessment	Field Assessment Confirmed Likelihood of Occurrence
				Additionally, the Noisy Miner (<i>Manorina melanocephala</i>) and Noisy Friarbird (<i>Philemon corniculatus</i>) were observed to be utilising the vegetation within the referral area. These species are aggressive competitors to the Regent Honeyeater. The site is located in proximity to continuous, higher quality foraging habitat within the White Rock Conservation Park and Flinders-Karawatha Bioregional Corridor to the east of the site. It is considered unlikely that Regent Honeyeaters would utilise the subject site, due to the presence of marginal foraging habitat, lack of large diameter trees, competition from other species and the presence of more suitable habitat in the surrounding landscape.
<i>Lathamus discolor</i>	Swift Parrot	Critically Endangered	Potential	Unlikely Extensive field surveys were completed across the referral and wider allotment by numerous consultants and the species was not observed. Preferred foraging species are present within the referral area, including <i>Corymbia citriodora</i> and <i>Eucalyptus tereticornis</i>. However, the site has been subject to historical modification, resulting in limited mature trees to provide suitable foraging species. Results of field surveys demonstrated that large trees in Assessment Unit 1 accounted for 37% compared to benchmark for Regional Ecosystem 12.9-10.2. While preferred foraging species are present within the referral area, the site lacks the larger, more productive trees that the species prefers. Further, the site is located in proximity to continuous, higher quality foraging habitat within the White Rock Conservation Park and Flinders-Karawatha Bioregional Corridor to the east of the site. With the more suitable vegetation located in close proximity to the site, it is considered unlikely the Swift Parrot would utilise the smaller, less productive vegetation on-site. As discussed in the desktop assessment, <i>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.</i> Essential habitat mapping for this species is not mapped on-site. Although the referral area contains potential foraging habitat, this species was not recorded during field surveys. Due to its extreme rarity and a lack of records within the

Species	Common Name	EPBC Status	Desktop Assessment	Field Assessment Confirmed Likelihood of Occurrence
				local area and SEQ, it is highly unlikely that this species occurs within the referral area.
<i>Rostratula australis</i>	Australian Painted Snipe	Endangered	Low	Unlikely Australian Painted Snipes are a cryptic wader species that prefers wetland habitat. Field surveys confirmed that no suitable wetland habitat to support the species is present within the referral area. Essential Habitat mapping for the species is likely a result of the proximity of records to the east and south east of the site within Swanbank and along Bundamba Creek. However, due to the lack of wetland habitat within the referral area, the species is not expected to utilise the referral area.
<i>Petauroides volans</i>	Greater Glider	Vulnerable	Potential	Low As discussed, the referral area is mapped entirely as Category B (remnant) including Least Concern Regional Ecosystem (RE) 12.9-10.2 with small areas of 'Of Concern' RE 12.9-10.7. Both of these REs are considered habitat for the Greater Glider with the 'Guide to greater glider habitat in Queensland' (Eyre 2022). As previously discussed, results of field surveys demonstrated that large trees in Assessment Unit 1 accounted for 37% compared to benchmark for Regional Ecosystem 12.9-10.2. This demonstrates a lack of large, potentially hollow bearing trees to support Greater Gliders. Also, fauna spotter catcher reports demonstrated that Greater Gliders did not inhabit the balance of the Hayfield Estate. Due to the level of historical modification, fragmentation and lack of large trees, the species is not expected to utilise the subject site.
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	Potential	Known Evidence, in the form of scats, of this species were identified during field surveys, however, no individuals were observed. Surveys indicated a 'low' overall usage of the referral area by this species (refer to Section 3.3.3.1 for survey methods). Although the referral area is highly disturbed through past vegetation clearing, the referral area provides habitat for this species throughout remnant vegetation.

Species	Common Name	EPBC Status	Desktop Assessment	Field Assessment Confirmed Likelihood of Occurrence
<i>Pteropus poliocephalus</i>	Grey-headed Flying Fox	Vulnerable	Potential	Moderate This species was not observed foraging as a flyover on-site the site during field surveys. No roosts or camps were recorded within the referral area, nor were any potential roost sites observed. The referral area is considered to provide foraging habitat for this species in association with eucalypt dominated remnant and regrowth vegetation. In addition, species recorded on-site are also considered as important winter or spring flowering species under the National Recovery Plan for the Grey-headed Flying-fox (DAWE 2021). The closest active Grey-headed Flying-fox roost is located approximately 3.28 km north west of the referral area. Reviewing the above, it is considered likely that this species may be a potential visitor to the site for foraging.

3.2 Description of the current land use and natural environment

Item 3.2 of the PD Request asks for ***“A description and map/s of the current land use, land topography, surface and ground water bodies, waterways and vegetation communities (habitat types as they relate to the above listed threatened species) on the proposed action area and adjoining areas.”***

Detailed ecological surveys have been undertaken across the referral area and larger allotment by numerous Ecologists over a 10-year period, from 2012 to 2024, to describe the ecological values of the referral area. Relevant findings are provided in the following sub-sections. Further detail is provided in *Fischer Road, Ripley – EPBC Significant Impact Guidelines - Referral Assessment October 2021* (refer to **Part B**).

3.2.1 Site Context

Contextually, the referral area is located within the northern extent of the RVPDA, approximately 5 km South-east of Ipswich and approximately 30.7km south-west of Brisbane. The referral area is bound by Fischer Road to the east and Boyland Way Road Reserve to the north. Being located within the RVPDA, urban development is increasingly surrounding the referral area from the south and west. At present, neighbouring properties include rural residential allotments and urban development.

An existing EPBC Act Approval immediately west of the referral area, Ripley Road project (EPBC 2017/8095), has recently commenced the next stage of vegetation clearing to continue the development of the masterplanned residential community. The property north of the referral area, opposite of Boyland Way Road Reserve, is also approved (EPBC 2020/8615), for residential development.

Additionally, other actions located further south and west of the referral area have been approved under the EPBC Act and at various stages of development. These surrounding actions include Ripley Town Centre

(EPBC 2015/7471), Ecco Ripley Residential Development (EPBC 2015/7513), Daleys Road Residential Development (EPBC 2010/5638) and Montereia Town (EPBC 2012/6644). Connectivity to the north and west is currently restricted by the Cunningham Highway and Ripley Road, respectively (refer **Plan A2**).

3.2.2 Current land use

The referral area was subject to historical modification, including vegetation clearing, where the vegetation was not maintained after the clearing, resulting in the subject site becoming increasingly vegetated, resulting in the site being dominated by remnant vegetation. However, the historical clearing has resulted in a lack of large diameter trees and a lack of hollows. Currently the land remains vacant.

The referral area is zoned as Urban Living under the RVPDA Development Scheme and the proposal has been guided on the intent of the development scheme. In addition, the project has received a whole of site MCU which applies to the larger allotment, being Lot 901 on SP317868 (refer to **Section 2.4**).



Photo Plate 1: Vegetation typical of the Category B (remnant) vegetation in the north.



Photo Plate 21: Vegetation typical of the Category B (remnant) vegetation to the south.



Photo Plate 3: Vegetation within central portion of the site

3.2.3 Topography

Topographically, the referral area generally flat, ranging in contours from 40 m to 60 m AHD. Sloping from east to west, towards a drainage feature that is an unnamed tributary of Bundamba Creek located off-site.

3.2.4 Waterways and waterbodies

No waterways or waterbodies are located within the referral area. A drainage feature is located to the west of the referral area that is an unnamed tributary of Bundamba Creek.

3.2.5 Vegetation Communities

The site has been subject to a Property Map of Assessable Vegetation (PMAV) assessment which involved ground-truthing Regional Ecosystems. The PMAV was certified by the Department of Natural Resources, Mines and Energy (DNRME) (PMAV 2005/101543) (refer **Figure A3**).

The PMAV shows the site is mapped entirely as Category B (remnant) vegetation encompassing the 19.1 ha of the referral area. Category B vegetation is described in **Table A6** and consists of 'Of Concern' and 'Least Concern' Regional Ecosystems (RE), with portions of the 'Of Concern' and 'Least Concern' vegetation mapped as essential habitat for *Phascolarctos cinereus* (Koala), *Rostratula australis* (Australian Painted Snipe) and *Coleus habrophyllus*, (refer **Figure A4**).

Essential habitat mapping for the Koala occurs within the 'Of Concern' composite RE's RE 12.9-10.2/12.9-10.7 and 'Least Concern' RE 12.9-10.2. Essential Habitat for the Australian Painted Snipe is located within stream buffer located outside referral area. While Essential Habitat for *Coleus habrophyllus* is located on-site is mapped within 'Least Concern' RE 12.9-10.2 and 'Of Concern' Composite RE 12.9-10.7, however, is lacking rocky habitat. Further, Protected Plants Flora Surveys in accordance with Queensland's NC Act 1992 did not record the species or potential habitat for the species on-site.

Table A6: Regional Ecosystem Descriptions

Regional Ecosystem	Status	Description
RE 12.9-10.2	Least concern	<i>Corymbia citriodora</i> subsp. <i>variegata</i> open forest or woodland usually with <i>Eucalyptus crebra</i> . Other species such as <i>Eucalyptus tereticornis</i> , <i>E. moluccana</i> , <i>E. acmenoides</i> and <i>E. siderophloia</i> may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of <i>Lophostemon confertus</i> (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
RE 12.9-10.7	Of Concern	<i>Eucalyptus crebra</i> +/- <i>E. tereticornis</i> , <i>Corymbia tessellaris</i> , <i>Angophora leiocarpa</i> , <i>E. melanophloia</i> woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c)
RE 12.9-10.16	Of Concern	Microphyll to notophyll vine forest +/- <i>Araucaria cunninghamii</i> . Characteristic species include <i>Argyrodendron</i> sp. (Kin Kin W.D.Francis AQ81198), <i>Araucaria cunninghamii</i> , <i>Agathis robusta</i> , <i>Backhousia myrtifolia</i> , <i>Cupaniopsis parvifolia</i> , <i>Dendrocnide photiniphylla</i> , <i>Rhodosphaera rhodanthema</i> , <i>Flindersia australis</i> , <i>F. xanthoxyla</i> , <i>Drypetes deplanchei</i> , <i>Olea paniculata</i> , <i>Diospyros geminata</i> , <i>Gossia bidwillii</i> , <i>Excoecaria dallachyana</i> and <i>Vitex lignum-vitae</i> . <i>Archontophoenix cunninghamiana</i> often present in gully floors. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 5a)

Surveys determined that although the referral area is mapped as multiple Regional Ecosystems the on-site vegetation is dominated by species consistent with RE12.9-10.2 As a result, the referral area is comprised of one (1) assessment unit (AU) for the purposes of habitat quality assessments (refer **Section 3.3.3.1** for methodology). Refer to **Table A7**. Contemporary field surveys were completed across the referral area, which included two (2) habitat transects and observations points to confirm the vegetation within the slivers of 'Of Concern' Composite RE 12.9-10.2/12.9-10.7/12.9-10.16. Field surveys confirmed the site can be accurately mapped as one assessment unit, being RE 12.9-10.2.

Table A7: Assessment Units

Assessment Unit	Category	Vegetation Status	Regional Ecosystem	Area (ha)
AU1	Category B	Remnant	RE12.9-10.2	19.1

Refer to **Part B – MNES Technical Ecological Report Section 4.3** for further vegetation descriptions.

3.2.6 Habitat for Threatened Species

As discussed previously, vegetative cover across the referral area consists of Category B (remnant) vegetation with relatively intact canopy despite historical clearing. However, as a result of historical clearing and thinning practices, few old growth trees were identified.

Essential Habitat under the VMA for *Coleus habrophyllus* is mapped across the entirety of the referral area in association with 'Least Concern' RE 12.9-10.2 and 'Of Concern' RE 12.9-10.7. Extensive field surveys have been completed across the referral area which includes surveys utilising the preferred random meander

techniques as outlined in the *Flora Survey Guidelines – Protected Plants* (DES 2020). No threatened flora species these extensive and targeted field surveys.

Essential habitat for *Rostratula australis* (Australian Painted Snipe) is mapped in associated with waterways and wetlands. The referral area is located adjacent to a mapped waterway and Endangered RE 12.3.3 located within the center of Lot 901 on SP317868. Potential occurrence of this species would be associated with proximity to potential habitat external to the referral area. As such, the referral does not contain habitat to support the species.

Essential habitat for the Koala is mapped across the entirety of the referral provided by 'Least Concern' RE 12.9-10.2 and 'Of Concern' regional ecosystems 12.9-10.2 and 12.9-10.7. RE 12.9-10.16 is not considered Essential Habitat for the Koala.

Koala habitat is defined under the now superseded Koala Referral Guidelines (DoEE 2014) as, "*any forest or woodland containing species that are known koala food trees, or shrubland with emergent food trees*". Field surveys determined that the referral area provide approximately 19.1 ha of vegetation which meets the definition of Koala habitat (refer **Part B – MNES Technical Ecological Report Plan 7**). Habitat critical for the survival of the Koala is defined by the DoEE (2014) as, "*habitat that is considered to be important for the species' long-term survival and recovery. An impact area that scores five (5) or more using the Habitat Assessment Tool for the koala (stipulated under the EPBC Act referral guidelines for the vulnerable koala (Table 4)) is highly likely to contain habitat critical to the survival of the koala*". Using the Koala Habitat Assessment Tool (KHAT) the site scored a 7 out of 10 and therefore contains habitat critical to the survival of the Koala (refer **Part B - Attachment 5, Koala Impact Assessment**).

The Department consider foraging habitat characteristics for Grey-headed Flying-fox analogous with vegetation characteristics that provide habitat critical to the survival of the Koala. In addition, the GHFF Recovery Plan identifies Habitat Critical to the survival of the species as where the existence of these important winter and spring flowering vegetation communities. Important winter flowering species include *Eucalyptus tereticornis*, *E. albens*, *E. crebra*, *E. fibrosa*, *E. melliodora*, *E. paniculata*, *E. pilularis*, *E. robusta*, *E. seeana*, *E. sideroxylon*, *E. siderophloia*, *Banksia integrifolia*, *Castanospermum australe*, *Corymbia citriodora*, *C. eximia*, *C. maculata*, *Grevillea robusta*, *Melaleuca quinquenervia* or *Syncarpia glomulifera*.

Although, no roosts or camps were recorded within the referral area nor was the species observed during field surveys, the presence of suitable foraging habitat means the GHFF cannot be discounted. The referral area is considered to provide potential foraging habitat for this species in association with important winter and spring flowering species within the eucalypt dominated remnant vegetation. The closest active Grey-headed Flying-fox roost is located approximately 3.28 km north-west of the referral area. A Nationally Important GHFF Roost is located 17.94 km north-east of the referral area at Westlake Drive, Mt Ommaney (400). Although Grey-headed Flying-fox forage over extensive areas and have been known to fly as far as 40 km to feed, before returning to their roost the same night (Eby 1991), it is considered unlikely that Grey-headed Flying-fox from the Mt Ommaney roost utilise the vegetation within the referral area given the availability of foraging habitat within closer proximity to the roost. Reviewing the above, it is considered likely that this species may occur or utilise on-site vegetation as foraging habitat.

SHG have undertaken numerous field surveys across the referral area and larger allotment from 2017 to 2024. These surveys were carried out to address MNES, however, the primary focus was placed on the *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox) as well as identifying any vegetation that may provide potential habitat for *Petauroides volans* (Greater Glider), *Rostratula australis* (Australian Painted Snipe), *Anthochaera phrygia* (Regent Honeyeater), *Lathamus discolor* (Swift Parrot) and *Coleus habrophyllus*. Despite extensive field surveys, it is considered that only *Phascolarctos cinereus* (Koala) and *Pteropus poliocephalus* (Grey-headed Flying-fox) are likely to utilise the site.

3.3 MNES Likelihood of Occurrence

Item 3.3 of the PD requests ***“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, 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 potential habitat).***
- c. Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas.***
- d. Information about known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.***
- e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days).***
- f. An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.***
- g. Results of any surveys undertaken.***

These items are addressed in the following sub-sections.

3.3.1 Threatened Ecological Communities

The PMST (refer to **Part B – Attachment 3, MNES Technical Ecological Report Appendix A**) indicated five (5) TECs as having potential to occur within 5 km of the referral area (refer to **Section 3.1.1**). A desktop Likelihood of Occurrence Assessment concluded that each of the identified TECs had a ‘low’ potential of occurrence within the referral area, as a result of historical disturbances.

Field surveys confirmed no TECs were present within the referral area (refer **Part B – Attachment 3, MNES Technical Ecological Report, Section 3.2** for survey methodology). Following field investigations, the likelihood of occurrence for each PMST identified TEC was downgraded to ‘unlikely’ (refer to **Part B – Attachment 3, MNES Technical Ecological Report Appendix D**).

3.3.2 Threatened Flora Species

The PMST returned thirteen (13) flora species, protected under the EPBC Act, found to potentially occur within 5 km of the referral area. The Likelihood of Occurrence Assessment determined that all of these species had were unlikely to occur within the referral area based on the desktop assessment.

Field surveys did not record any threatened flora species within the referral area, including a Protected Plants Flora Survey in accordance with Queensland's NCA 1992 (refer **Part B – MNES Technical Ecological Report, Section 3.2** for survey methodology). Following field investigations, the likelihood of occurrence for each PMST identified threatened flora species were downgraded to 'unlikely' (refer to **Part B – Attachment 3, MNES Technical Ecological Report Appendix D**).

3.3.3 Threatened Fauna Species

As discussed in **Section 3.1.2**, The PMST returned twenty-three (23) fauna species protected under the EPBC Act, found to potentially occur within 5 km of the referral area. The Likelihood of Occurrence assessment determined only five (5) fauna species as potential occurrences for further investigations. These species are outlined in **Table A4**. All other threatened and/or migratory fauna species were assessed being 'unlikely' to occur.

This section describes the threatened fauna species that have the potential to be present at and in the vicinity of the referral area and those determined to be unlikely occurrences, however, remained target species for field surveys throughout the assessment (refer **Table A4**). Each threatened fauna species either potential occurrence or target species is discussed within the following sub-sections.

3.3.3.1 Koala (*Phascolarctos cinereus*)

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

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

Home ranges are known to vary considerably due to a variety of factors including location (e.g. home ranges in habitats of lower productivity being larger than those within higher quality habitats) and availability of preferred forage trees, though typically, males have larger home ranges on average than females. In SEQ, Koala Coast home ranges were found to vary between 2-20 ha (Thomson 2006), whilst in rural SEQ, home ranges varied between 5.3-91.4 ha (White 1999). Koalas successfully use highly fragmented habitats that have only small remnants of the original vegetation (White 1999; QEPA 2006 and references cited therein). They also use young forest and highly modified vegetation such as grazed, disturbed or thinned forest and regrowth areas, moving significant distances across the ground between preferred trees (e.g. White 1999). Research has also found they prefer larger trees (QEPA 2006 and references cited therein).

While Koalas choose their habitat based on the suitability of food trees, the reasons for choosing these trees are not well understood. Soil fertility is thought to strongly influence the acceptability, palatability and nutritional content of selected browse species, whilst chemical composition is also suspected as a major factor determining the acceptance of selected foliage (Cork & Sanson 1990, Cork & Braithwaite 1996; Moore & Foley 2000; Moore *et al.*, 2005). Collectively, the suite of tree species considered to be of primary and/or secondary importance to Koalas within SEQ include the following (after: Pahl 1993; QEPA 2002 & 2006; & EHP 2012): *Eucalyptus acmenoides*, *E. carnea*, *E. crebra*, *E. exserta*, *E. fibrosa*, *E. grandis*, *E. major*, *E. moluccana*, *E. populnea*, *E. propinqua*, *E. racemosa*, *E. resinifera*, *E. robusta*, *E. seeana*, *E. siderophloia*, *E. signata*, *E. tereticornis*, *E. tindaliae*, *E. microcorys*, *E. umbra*, *Corymbia citriodora*, *C. intermedia*, *Lophostemon confertus*, and *Melaleuca quinquenervia*.

Current data indicate that Koalas in the SEQ (though also the Brigalow Belt and Mulga Lands bioregions) are subject to substantial declines (Dique *et al.*, 2004; DERM 2009). The Koala Coast has been the subject of long-term monitoring of Koala ecology and population dynamics and the data derived from the area have been widely used as an important reference to assess the overall health of the Koala population of SEQ, as well as provided reference points for assessments of Koala elsewhere in the bioregion. On the basis of the results of the former DERM (now DES) 2008 Koala Coast Koala survey, the 2008 population estimate of 2,279 Koalas represented a 51% decline in less than three years and a 64% decline in the decade following the original 1996-1999 estimate of 6246 Koalas (see data cited in Dique *et al.*, 2004 and DERM 2009). This decline in Koala population is supported by the recent Rhodes *et al.* (2015) study which indicates Koala populations have declined across SEQ. DERM (2009) identified that the largest declines occurred in bushland areas which showed a 59% reduction in Koala numbers compared with a 30% reduction in urban areas. The large reduction of Koalas in otherwise secure bushland was thought to be a flow on effect from excessive habitat loss and mortality in urban areas (DERM 2009). DERM (2009) concluded that the reduction in adequate recruitment to apparently secure bushland habitat areas is likely to be evidence of a dynamic process operating between the urban and bushland Koala populations. DERM (2010) concluded that whilst there was a decline detected between the 2008 and 2010 surveys, the apparent difference was not statistically significant, meaning that there was no clear evidence of a decrease between the two years when margins of error were considered. DERM (2010) also concluded that the long-term downward trend since the 1996-1999 survey was still statistically significant, showing a 68 per cent decline between 1996-1999 and the most recent (2010) survey.

The main identified threats to the Koala are loss and fragmentation of habitat, vehicle strike, disease, and predation by dogs (*Canis lupus familiaris*) (DERM 2009). Studies completed as part of the Moreton Bay Rail project (DTMR 2016) found that between 2013 and 2016, 113 Koalas had been killed by wild dogs with an additional 38 Koala deaths suspected as wild dog predation, 82 Koala deaths caused by illness and nine (9) vehicle strike deaths. These figures indicate that the threat of wild dog predation is at the forefront, while disease and vehicle strikes are also ongoing contributors to Koala deaths.

b. Quantification of the extent of habitat (including maps identifying known or potential habitat).

The referral area has been subject to historical clearing, with the referral area becoming increasingly vegetated over time and now dominated by maturing vegetation. The rectified PMAV (ref: 2005/101543) shows the referral area is dominated by Category B (remnant) vegetation (**Figure A3**), described as 'Least

Concern' RE 12.9-10.2 with small polygons of 'Of Concern' composite RE 12.9-10.2/12.9-10.7/12.9-10.16 (**Figure A4**). Surveys determined that although the referral area is mapped as multiple regional ecosystems the on-site vegetation is dominated by species consistent with RE12.9-10.2 and therefore comprises of only one (1) assessment unit (AU). Additionally, the referral area is dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the now superseded Koala Referral Guidelines and dominated by non-juvenile Koala habitat trees (NJKHTs). NJKHT species include *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia citriodora* (Spotted Gum) and *Corymbia intermedia* (Pink Bloodwood).

An assessment against the Koala Habitat Assessment Tool (KHAT) of the superseded Koala Referral Guidelines determined that the vegetation within the referral area (19.1 ha) is habitat critical to the survival of this species (refer **Part B – Attachment 5 – Koala Impact Assessment**).

c. Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas.

The field surveys identified potential habitat and presence of this species within the referral area. The referral area and adjoining properties have been subject to historical clearing and modifications reducing quality and connectivity of habitat within the referral area and surrounding landscape. Although properties immediately surrounding the referral area are largely vegetated, they are located within the RVPDA and are earmarked for urban development.

It is acknowledged that the referral area may provide foraging, shelter and/or dispersal habitat for the Koala. The referral area is considered to provide habitat critical to the survival of this species in accordance with the KHAT with a score of 7/10. However, the importance of the habitat within the referral area is significantly reduced given the approved and future development within the adjoining properties and wider region. Approved developments surround the referral area to the north, west and south, separating the referral area from other bushland habitat.

Connectivity other bushland habitat is restricted by urban development, Ripley Road, the Centenary Highway and Cunningham Highway which surround the referral area. Over 2,200 ha of bushland habitat is located south of the Centenary Highway within the Flinders-Goolman Critical Habitat Area identified by Ipswich City Council. Approximately 4.7 km south-east an additional 2,600 ha of bushland habitat is located within White Rock Critical Habitat Area. The land between the referral area and White Rock Critical Habitat Area is fragmented by roads, including Ripley Road and the Centenary Highway, residential development and existing cleared areas.

A Modified Habitat Quality Assessment (MHQA) was undertaken across the referral area to determine the quality of habitat within the referral area (refer **Plan A3 and Plan A4 and Section 4.4.1**). This assessment determined habitat quality within the referral area scored a 7 out of 10.

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

No individuals have been identified within the referral area during on-site surveys. However, one of the SAT surveys did record indirect evidence of this species, in the form of scats, occurring within the referral area. Additionally, a review of the Queensland WildNet database identifies one hundred and seventeen (117) historical records of this species within 5 km of the referral area.

In SEQ, 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 (Rhodes *et al.*, 2015). 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. The Rhodes *et al.* (2015) data indicates that the average Koala density in Ipswich LGA from 2011 to 2015 is 0.03 Koalas/ha.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days).

The referral area, and larger allotment, has been subject to numerous field surveys by various ecologists to describe ecological value of the referral area. Field surveys were undertaken across different seasonal conditions favourable to the detection and identification of MNES. Surveys were undertaken in 2012, 2014, 2017, 2018 and 2021 using various methods (refer **Part B – Attachment 3, MNES Ecological Technical Assessment, Table 1**). SHG have undertaken all of the surveys since 2017 during Winter and Spring, totalling approximately 76.58 person hours (**Plan A3**).

Following the submission of the referral another 201.83 person hours were spent on-site in March, April and May (Autumn) 2022 and October and November (Spring) 2024 conducting contemporary targeted surveys for MNES. These surveys included MHQA transects for the Koala and Grey-headed Flying-fox, SAT surveys and motion sensor camera deployment and a DGPS Tree Plot of all individual site trees including their relative habitat value. All of the surveys undertaken across the referral area in the last 5 years to target this species are described in detail below.

Diurnal Meanders

The referral area was traversed to ensure all species (flora and fauna including Birds) 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 observational survey included identification of ecological features and values such as broad vegetation communities, fauna habitats and ecological corridors. Identification and description of the fauna habitats

present within the area included any habitat trees. Specific attention was paid to threatened flora and fauna species including avian species. Threatened flora and fauna species are those defined as a species that is listed as Critically Endangered, Endangered, Vulnerable or Conservation Dependent under the EPBC Act.

Motion Detection Camera

Two (2) motion detection camera traps were deployed within the referral area to target threatened species, cryptic fauna and identify invasive predators for the duration of 32 nights from 7 April to 10 May 2022. The camera was fixed to a tree approximately 70cm from the ground and 100-150cm in front of the bait station containing a peanut butter and oat mixture. Following the deployment duration, the camera images were analysed with all species identified subsequently added to the referral area fauna list.

MHQA Transects

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 (MHQA) tool. 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 referral area. Refer **Section 4.4.1** for further details.

Spot Assessment Technique

Surveys to understand Koala presence were undertaken across the referral area in accordance with the methodology developed by the Australian Koala Foundation (AKF) (Phillips & Callaghan 2011) and specified in the EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (hereby referred to as 'the Koala referral guideline').

The SAT method was implemented within vegetation located in the northern portion of the referral area. This methodology is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT method 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 Koala food tree or otherwise important for Koalas, and recording any evidence of Koala usage of that tree including physical 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.

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. Assessment of each tree involves a systematic search for Koala scats beneath the tree within a 1 m 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 (Phillips & Callaghan 2011).

DGPS Tree Plot

All trees over 100 mm DBH were plotted throughout the impact area with a handheld GPS device (Trimble) to record locations (accuracy ± 1 m), and the following parameters of each tree specimen were recorded:

- tree species, via a combination of observations of the gum nuts, buds, leaves, bark and growth form;

- diameter of the trunk of the tree measured using the standard method of Diameter at Breast Height (DBH);
- height of the tree estimated in metres from ground;
- canopy spread estimated in metres from ground;
- health assessment (canopy, trunk); and
- habitat values (for example, presence and/or number of hollows, nests, termites, scratches and scats).

The entire tree trunk and branches of every tree were visually surveyed from ground for presence of MNES and potential habitat values including hollows.

f. An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.

In accordance with the *EPBC Act Referral Guidelines for the Vulnerable Koala*, the Spot Assessment Technique (SAT) was applied in to search the referral area for the potential presence of the Koala. The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a focal tree where a Koala or scats are found. The next closest habitat tree to the first tree is then assessed and so on until the 30 closest trees to the original focal tree have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within a 1 m radius of the trunk. After approximately 2-minutes of searching for scats, the base of the trunk is observed for scratches and the crown for potential Koala presence.

Surveys of Koala activity levels were conducted across the referral area to determine the likelihood of occurrence throughout the entire extent, and identify whether there was any concentrated occurrence. A total of ten (10) Koala SAT surveys were conducted across the referral area, with six (6) completed by Austecology in 2014 and another four (4) completed by SHG in 2022 (**Plan A3**). Sampling was conducted in accordance with the *EPBC Act Referral Guidelines for the Vulnerable Koala* which notes 'sampling is only appropriate for moderate to large areas (*i.e.* several hectares or more); census (surveying the entire site) is relevant for small sites and improves confidence in the data'.

The Australian Koala Foundation Koala activity level classification table (following Philips and Callaghan 2011) provides an estimate of Koala utilisation based on defined Activity Categories. The East Coast (med-high) Activity Category is appropriate for the referral area. The evidence suggests that while the referral area is utilised by Koalas, SAT surveys indicated a relatively low level to no Koala usage.

Two (2) infrared sensing cameras were deployed in April 2022 (**Plan A3**). Additionally, opportunistic searches across the entire site for Koalas and other MNES were also undertaken as part of the field survey effort in previous years and contemporary surveys. Despite comprehensive surveys, no Koalas nor other MNES were observed within the referral area during the survey periods. In combination with the ground-

truthing of vegetation communities, and identification of Koala food trees and scats, the surveys determined the presence of this species within the referral area.

Notably, over approximately three (3) weeks in 2024 (28th October to 13th November) all trees over 100 mm DBH were DGPS tree plotted across the entire impact site. As such, the relative habitat value and or presence or absence of MNES has been recorded for every single tree that will be impacted.

The site surveys are relatively detailed down to the individual tree and are considered adequate.

g. Results of any surveys undertaken.

Koala Habitat and SAT surveys were undertaken on-site in accordance with the methodology developed by the Australian Koala Foundation (as per Phillips & Callaghan 2011) and specified in the *EPBC Act Referral Guidelines for the Vulnerable Koala* (refer to **Section 3.3.3.1** for survey methods). Surveys of Koala utilisation of the site were conducted across the referral area to determine the likelihood of occurrence throughout the entire extent and identify whether there was any concentrated occurrence. Austecology completed six (6) SATs throughout the referral area in 2014, resulting in low level of activity (Austecology, 2014). SHG conducted another four (4) Koala SAT surveys were conducted in late March 2022 in conjunction with Modified Habitat Quality Assessments (refer **Plan A3**). Of the SAT surveys, one (1) location returned a 'low' activity level and three (3) returned 'Nil' activity levels (refer to **Table A8**).

Refer to **Attachment A5** for the raw SHG SAT survey data.

Table A8: 2022 Summary of SAT Results

SAT Site	Evidence of Koala Use (%)	East Coast (Med-High) Koala Use (High/Medium/Low)
March 2022		
1	10.00	Low
2	0.00	Nil
3	0.00	Nil
4	0.00	Nil

3.3.3.2 Grey Headed Flying Fox (*Pteropus poliocephalus*)

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

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.

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.

Individuals migrate in complex patterns in response to changes in food production. They feed primarily on the nectar and pollen in eucalypt flowers and fleshy subtropical rainforest fruits, and around 100 species of plant have been recorded in their diet. Camps are formed in response to the location and timing of local flowering and fruiting events. An area will be occupied for a few weeks to several months until the food resource is exhausted.

b. Quantification of the extent of habitat (including maps identifying known or potential habitat).

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 eucalypts. No direct observations were made during field surveys. In addition, no roosting sites were observed within the referral area or in the vicinity of the site.

The nearest known roost site for this species within recent surveys is located approximately 3.3 km west of the referral area located at Yamanto (Site 479). It is therefore considered likely that this species utilise the referral area as foraging habitat due to the proximity of GHFF roosts and important winter and spring flowering species on-site.

c. Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas.

As discussed, no roosts for this species were identified within the referral area, nor where species observed during field surveys. Vegetation within the referral area is considered to provide foraging habitat for this species, given the presence of important winter and spring flowering species including *Corymbia* and eucalypts within the referral area. However, habitat did not contain any special or unique values and the nearest known roost site is located approximately 3.28 km north west of the referral area. The removal of the potential foraging habitat is considered unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of flowering flora in the surrounding area, particularly the dedicated conservation areas including the Flinders Karawatha Corridor. This corridor is the largest remaining continuous stretch of open eucalypt forest in SEQ, extending from the Karawatha Forest on the southern edge of Brisbane City, along Oxley Creek, through the Greenbank Military Training Area and south along the Teviot Range to Flinders Peak, Mt Joyce and Wyaralong Dam, north-east of Boonah.

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

There are no observed roosts within the referral area. Eight (8) known roosts supporting Grey-headed Flying-fox are located within 20 km of the referral area, with the nearest known roost site with recent records (2018-present) located in Yamanto, approximately 3.28 km north west of the site (refer **Table A9**).

Table A9: Grey-headed Flying-fox camps within 20km of referral area (DCCEEW, 2024)

ID	Location	Approximate Distance (km)	GHFF Records	BFF Records	Survey Date
479	Yamanto	3.28 km	500-2,499	500-2,499	11/2020
595	Goleby Avenue, Queens Park	4.50 km	500-2,499	2,500-9,999	02/2022
574	Paice Street, Bundamba	5.15 km	500-2,499	1-499	02/2022
191	Woodend	7.06 km	1-499	500-2,499	11/2019
577	Brodzig Road, Chuwar	9.64 km	1-499	0	08/2014
428	Pan Pacific Peace Garden, Redbank	10.54 km	500-2,499	500-2,499	02/2022
140	Barbara Street, Camira	12.90 km	1-499	1-499	02/2020
805	Walloon, Poplar Street Reserve	12.93 km	1-499	1-499	11/2018
878	Redbank Plains, Phillip Street	14.15 km	500-2,499	1-499	02/2022
1025	Riverhills, Zambesi Street	15.74 km	500-2,499	500-2,499	11/2021
337	Waterford Road, Ellen Grove	15.95 km	1-499	1-499	11/2018
400	Westlake Drive, Mt Ommaney*	17.94 km	500-2,499	500-2,499	02/2022
1219	Lilac Street, Inala*	18.87 km	2,500-9,999	2,500-9,999	02/2021
1200	Edenbrooke	19.74 km	500-2,499	500-2,499	02/2022
1035	Rosewood, John Street Reserve	19.75 km	1-499	1-499	11/2019

*Nationally Important Flying-fox Camp

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days).

The referral area, and larger allotment, has been subject to numerous field surveys by various Ecologists to describe ecological value of the referral area. Field surveys were undertaken across different seasonal conditions favourable to the detection and identification of MNES. Surveys were undertaken in 2012, 2014, 2017, 2018 and 2021 using various methods (refer **Part B – Attachment 3, MNES Ecological Technical Assessment, Table 1**). SHG have undertaken all of the surveys since 2017 during Winter and Spring, totalling approximately 76.58 person hours.

Following the submission of the referral another 17.83 person hours were spent on-site in March, April and May (Autumn) 2022 conducting contemporary targeted surveys for MNES. These surveys included MHQA transects for the Koala and Grey-headed Flying-fox, SAT surveys and motion sensor camera deployment. All of the surveys undertaken across the referral area in the last 5 years to target this species are described in detail below.

Diurnal Meanders

The referral area was traversed 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 observational survey included identification of ecological features and values such as broad vegetation communities, fauna habitats and ecological corridors. Identification and description of the fauna habitats present within the area included any habitat trees. Specific attention was paid to threatened flora and fauna species. Threatened flora and fauna species are those defined as a species that is listed as Critically Endangered, Endangered, Vulnerable or Conservation Dependent under the EPBC Act.

f. An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.

In accordance with the *Survey guidelines for Australia's threatened bats*, both desktop searches and field surveys were undertaken to determine this species presence/absence within the referral area and habitat extent. Thus, the following was undertaken:

1. Prior to the survey – a review of known flying fox camps was conducted for the project area, and the wider general area.
2. Daytime field surveys for camps for determining the presence of unrecorded day roosts.
3. Ground-truthed vegetation mapping and identification of foraging resources.

In addition to the above, surveys the referral area, and larger allotment, has been subject to numerous field surveys by various Ecologists from 2012 to 2024 across different seasonal conditions favourable to the detection and identification of flora and fauna species. The methodologies used during these surveys to describe ecological value of the subject site, are outlined in **Part B – Attachment 3, MNES Ecological Technical Assessment, Table 1.**

a. Results of any surveys undertaken.

Opportunistic and targeted surveys did not locate roosting sites in the application area or within the immediate vicinity of the referral area. Historical surveys including spotlighting where Grey-headed Flying-fox individuals were not recorded foraging or as fly overs.

Despite targeted spotlighting surveys, GHFF were not observed utilising the site. Regardless, due to the proximity of a known GHFF Roost (Yamanto 479) as well as preferred foraging species, it is considered likely that GHFF individuals would utilise the site as foraging habitat.

3.3.3.3 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 1,200 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 presence of large trees and hollow-bearing trees within a forest provides essential foraging and sheltering resources for Greater Gliders in Queensland, while small trees may also be selected for foraging and occasionally denning (Eyre *et al.* 2022). Hollows utilised by Greater Gliders have been described by a mean diameter entrance of 18 cm (Kehl & Borsboom 1984) and between 8 to 15 cm (Mackowski 1984). However Greater Glider individuals located within Woodlinks development (EPBC ref 2013/6866) in 2019 were associated with hollows ranging from 50-100mm diameter (i.e. 5-10 cm).

The species is considered to be particularly sensitive to forest clearance and intensive logging practices (Kavanagh and Wheeler, 2004). Subsequently, 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 km² to maintain viable populations (Eyre 2002).

b. Quantification of the extent of habitat (including maps identifying known or potential habitat).

Vegetation within the referral area is mapped as remnant vegetation, consisting of vegetation dominated by *Eucalyptus* and *Corymbia* species that has been subjected to historical disturbance through logging, rubbish dumping, vehicle use and fire. Modified Habitat Quality Transects completed demonstrated a lack of large trees, with the total number of large trees recorded accounting for only 37.5% of the Benchmark for the Regional Ecosystem.

In addition, to the west of the site, large areas of vegetation have been cleared to facilitate a residential development (EPBC Ref: 2017/8095) completed by the proponent. Fauna spotter catcher reports demonstrate that no Greater Gliders were recorded within the neighbouring vegetation (refer **Plan A9** and **Attachment A4**), supporting the low likelihood of occurrence within the Hayfield School referral area.

A search of Atlas of Living Australia using a 10 km search radius from the site returned nineteen (19) records of Greater Glider, with the most recent record from 2001. Other surrounding records pre-date the year 2001. Further, recent records of Greater Glider were recorded in White Rock Conservation Area in 2023. According to the Queensland BioMaps search tool, the closet record to the site was recorded in 1992 and is located approximately 5.2km to the north east of the site. It is noted significant barriers exist between the site and this record in the form of industrial areas.

c. Assessment of quality and importance of known potential habitat for the species or communities within the proposed action site and surrounding areas.

The site has been subject to historical disturbance through forestry practices of which is a known deterrent to the species. Some larger trees and hollow-bearing trees are present within the referral area, which are required by the species for breeding and shelter. Greater Gliders are reported to be absent from forests with fewer than six habitat trees per hectare, however, a recent review of Greater Glider habitat in Queensland suggests the presence of large trees rather than densities of hollow-bearing trees can be used to define whether an area is Greater Glider habitat or not habitat (Eyre *et al.* 2022).

Disturbances including logging, vehicle use and rubbish dumping present onsite are deterrents to the species. Further, as discussed, fauna spotter catcher reports from the vegetation clearing completed for the adjacent development did not record Greater Gliders utilising the vegetation. Therefore, it is considered that Greater Gliders are not present on-site.

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

No recent records of the species occur within 5 km of the development footprint. The closest record located approximately 4.44 km to the north of the site is dated from 1930. Records of the species within a 5 km and

20 km buffer to the site is provided in **Plan A8a**. Recently, Greater Gliders were observed in White Rock Conservation area, located approximately 7.03 km to the south east of the site.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort.

Spotlight searches were conducted over the during historical field surveys by two ecologists. High-powered spotlights (Fenix HP25R Rechargeable LED Headlamp – 1000 lumens) were used to detect cryptic and nocturnal fauna. The site was not easily accessed via vehicle therefore meanders were conducted on foot. Large habitat trees were specifically targeted during the surveys. The species is readily recorded during spotlight surveys if present. No Greater Glider were recorded.

3.3.3.4 Swift Parrot (*Lathamus discolor*)

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

The Swift Parrot breeds in Tasmania during the summer and the entire population migrates north of mainland Australia for the winter. The breeding range of the species is largely restricted to the east and south-east coast of Tasmania and closely mirrors the distribution of Blue Gum (*Eucalyptus globulus*) (Saunders & Tzaros, 2011).

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 (Kennedy and Overs, 2001) and on *psyllid* lerps, seeds and fruit (Kennedy and Tzaros, 2005). Commonly used lerp infested trees include Inland Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*), Blackbutt (*E. pilularis*), and Yellow Box (*E. melliodora*). Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Forest Red Gum (*E. tereticornis*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*).

Notably, concerted conservation efforts have more recently focused on mitigating the loss of old growth tree habitat and predation by imported Sugar Gliders in Tasmania through the installation of nest boxes including with nocturnal exclusion mechanism. Relative to the scarcity of breeding habitat and loss of young to introduced predators in breeding regions, the relative availability of winter foraging habitat across the breadth of mainland Australia is generally considered less of a constraint on Swift Parrot persistence.

b. Quantification of the extent of habitat (including maps identifying known or potential habitat).

This species was not identified during field surveys. The National Recovery Plan for the Swift Parrot (*Lathamus discolor*) (Saunders & Tzaros 2011) 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". A review of the VMA Vegetation Management Supporting map indicates that the referral area does not contain essential habitat for the Swift Parrot.

Preferred foraging species in Queensland as identified in the National Recovery Plan include *Eucalyptus macrocarpa* (Grey Box), *Eucalyptus melliodora* (Yellow Box), *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus tereticornis* (Forest Red Gum). In addition, *Corymbia citriodora* (Spotted Gum) and *Eucalyptus pilularis* (Blackbutt) are considered preferred foraging species. The species was not identified during field surveys, however, some potential foraging habitat was noted within the referral area, including *Corymbia citriodora* and *Eucalyptus tereticornis*. Due to historical logging and agriculture activities, large diameter eucalypts are sparse within the vegetation, where transect data demonstrates the site scored 37.5% against the Regional Ecosystem benchmark.

c. Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas.

Eucalyptus and *Corymbia* species dominate the referral area, however, large diameter trees are limited across the subject site. The maturity of these species impacts the reliability of flowering events and due to historical disturbances including vegetation clearing, the site lacks suitable large trees, reducing potential foraging species.

Field surveys identified two (2) preferred foraging species *Corymbia citriodora* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum) within the referral area. As such there is potential that the Swift Parrot would utilise the vegetation within the referral area, however, the referral area is not considered to contribute to important habitat for the species. Additionally, the significant foraging vegetation is provided within the surrounding landscape and in particular the Flinders Karawatha Corridor.

Additionally, Swift Parrots are known to be outcompeted by aggressive bird species such as *Manorina melanoccephala* (Noisy Miner) which have been observed utilising the vegetation on-site which may reduce potential for the species to opportunistically forage on-site. Additionally, this species was not observed across the referral area during field surveys.

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

The species has not been recorded within 5 km of the referral area, with one (1) record approximately 10 km from the subject site, located in the suburb of Purga. In addition, the species has been recorded in Springfield, proximity 11 km southeast of the subject site. A habitat analysis combining potential habitat and recording Atlas of Living Australia records of this species is provided in **Plan A10**.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days).

The referral area, and larger allotment, has been subject to numerous field surveys by various ecologists to describe ecological value of the referral area. Field surveys were undertaken across different seasonal conditions favourable to the detection and identification of MNES. Surveys were undertaken in 2012, 2014, 2017, 2018 and 2021 using various methods (refer **Part B – Attachment 3, MNES Ecological Technical Assessment, Table 1**). SHG have undertaken all of the surveys since 2017 during Winter and Spring, totalling approximately 76.58 person hours.

Following the submission of the referral another 17.83 person hours were spent on-site in March, April and May (Autumn) 2022 conducting contemporary targeted surveys for MNES. These surveys included MHQA transects for the Koala and Grey-headed Flying-fox, SAT surveys and motion sensor camera deployment. All of the surveys undertaken across the referral area in the last 5 years to target this species are described in detail below.

Diurnal Meanders

The referral area was traversed 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 observational survey included identification of ecological features and values such as broad vegetation communities, fauna habitats and ecological corridors. Identification and description of the fauna habitats present within the area included any habitat trees. Specific attention was paid to threatened flora and fauna species. Threatened flora and fauna species are those defined as a species that is listed as Critically Endangered, Endangered, Vulnerable or Conservation Dependent under the EPBC Act.

f. An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.

Desktop searches and analysis were undertaken prior to field surveys to determine the likelihood of this species occurrence within or near the referral area. As noted, the closest record is located 12 km north-east of the site within the Springfield Lakes area in 2019 according to Atlas of Living Australia.. This assessment determined that based on the data this species was considered a 'moderate' likelihood of occurrence. Following initial field surveys this was downgraded to 'low' as no sightings were recorded and preferred foraging species were limited. As the species is considered a 'low' likelihood of occurrence, no targeted Swift Parrot surveys were undertaken.

The *Survey guidelines for Australia's threatened birds* recommends 20 hours for area searches or transect surveys in areas less than 50 ha. Additionally, the *Survey guidelines for Australia's threatened birds* recommends surveys for this species are conducted between March and July on mainland Australia. Targeted searches for EPBC Act listed species and random diurnal meanders were undertaken by SHG in June, July and August 2017. Threatened fauna surveys undertaken in 2018 and 2021 occurred in June and

July, respectively, during optimal survey periods. Bird species were also continuously recorded throughout other survey works. In total, 94.4 person hours have been devoted to targeted and opportunistic observations for EPBC Act listed species between 2017 and 2022. The surveys undertaken are considered adequate to ensure possible occurrences and potential habitat within the referral area was identified, thus this species is considered a 'low' likelihood of occurrence.

g. Results of any surveys undertaken.

The survey effort did not record this species. Vegetation and fauna habitat assessments also determined that this species was unlikely to utilise the vegetation located within the site and thus is considered a 'low' likelihood of occurrence. The proposed action is therefore considered unlikely to have a significant impact on this species.

3.3.3.5 Regent Honeyeater (*Anthochaera phrygia*)

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

The Regent Honeyeater is endemic to mainland south-eastern Australia. It has a patchy distribution which extends from SEQ, through New South Wales and the Australian Capital Territory, to central Victoria. Records are widely distributed across its range, but it is 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 New South Wales and one in Victoria.

The species mostly inhabits inland 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* sp.) where it feeds on needle-leaved mistletoe and sometimes breeds. It sometimes utilises lowland coastal forest, which may act as a 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.

b. Quantification of the extent of habitat (including maps identifying known or potential habitat).

This species was not identified during field surveys however, the referral area is comprised of Category B (remnant) vegetation dominated by Eucalypt and *Corymbia* species, particularly *Corymbia citriodora* (Spotted Gum). This species relies on vegetation with diversity of species and abundance of mistletoe for food resources throughout the year. Vegetation within the referral area is not considered to provide preferred habitat for this species (refer below for further details).

c. Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action area and surrounding areas.

Eucalypt and *Corymbia* species dominate the referral area. The maturity of these species impacts the reliability of flowering events. Due to historical disturbances the remnant vegetation contains limited large diameter trees.

Field surveys identified two (2) preferred foraging species *Corymbia citriodora* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum) within the referral area, however no mistletoe was recorded. In addition, the referral area contains limited large diameter tree specimens. As such, there is potential that the Regent Honeyeater would utilise the vegetation within the referral area, however, the referral area is not considered to contribute to important habitat for the species. Additionally, the significant foraging vegetation is provided within the surrounding landscape and in particular the Flinders Karawatha Bioregional Corridor.

Regent Honeyeaters experience competition from aggressive species such as Noisy Miner (*Manorina melanoccephala*) and Noisy Friarbird (*Philemon corniculatus*). Both of these species were observed to be utilising the vegetation within the referral area, which may reduce potential for Regent Honeyeaters to opportunistically forage within the referral area. Overall, there is a low potential that the Regent Honeyeater would utilise the vegetation within the referral area as a result of historical disturbances, weed invasion and competition from other more aggressive species.

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

The species has been recorded approximately 5 km from the referral area. Fifteen (15) records of this species from Atlas of Living Australia occurs within 10 km, however these records are only within two (2) separate locations (**Plan A10**). A habitat analysis combining potential habitat and recording Atlas of Living Australia records of this species is provided in **Plan A8a** in **Section 12**.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc.) and search effort (e.g. 20 hours over eight days).

The referral area, and larger allotment, has been subject to numerous field surveys by various ecologists to describe ecological value of the referral area. Field surveys were undertaken across different seasonal conditions favourable to the detection and identification of MNES. Surveys were undertaken in 2012, 2014, 2017, 2018 and 2021 using various methods (refer **Part B – Attachment 3, MNES Ecological Technical Assessment, Table 1**). SHG have undertaken all of the surveys since 2017 during Winter and Spring, totalling approximately 76.58 person hours.

Following the submission of the referral another 17.83 person hours were spent on-site in March, April and May (Autumn) 2022 conducting contemporary targeted surveys for MNES. These surveys included MHQA transects for the Koala and Grey-headed Flying-fox, SAT surveys and motion sensor camera deployment. All of the surveys undertaken across the referral area in the last 5 years to target this species are described in detail below.

Diurnal Meanders

The referral area was traversed 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 observational survey included identification of ecological features and values such as broad vegetation communities, fauna habitats and ecological corridors. Identification and description of the fauna habitats present within the area included any habitat trees. Specific attention was paid to threatened flora and fauna species. Threatened flora and fauna species are those defined as a species that is listed as Critically Endangered, Endangered, Vulnerable or Conservation Dependent under the EPBC Act.

f. An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.

Desktop searches and analysis were undertaken prior to field surveys to determine the likelihood of this species occurrence within or near the referral area. As noted, the closest record is located 12 km north-east of the site within the Springfield Lakes area in 2019 according to Atlas of Living Australia. This assessment determined that based on the data this species was considered a 'moderate' likelihood of occurrence. Following initial field surveys this was downgraded to 'low' as no sightings were recorded and preferred foraging species were limited. As the species is considered a 'low' likelihood of occurrence, no targeted Swift Parrot surveys were undertaken.

The *Survey guidelines for Australia's threatened birds* recommends 20 hours for area searches or transect surveys in areas less than 50 ha. Additionally, the *Survey guidelines for Australia's threatened birds* recommends surveys for this species are conducted between March and July on mainland Australia. Targeted searches for EPBC Act listed species and random diurnal meanders were undertaken by SHG in June, July and August 2017. Threatened fauna surveys undertaken in 2018 and 2021 occurred in June and July, respectively, during optimal survey periods. Bird species were also continuously recorded throughout other survey works. In total, 94.4 person hours have been devoted to targeted and opportunistic observations for EPBC Act listed species between 2017 and 2022. The surveys undertaken are considered adequate to ensure possible occurrences and potential habitat within the referral area was identified, thus this species is considered a 'low' likelihood of occurrence

g. Results of any surveys undertaken.

The survey effort did not record this species. Vegetation and fauna habitat assessments also determined that this species was unlikely to utilise the vegetation located within the site and thus is considered a 'low' likelihood of occurrence. The proposed action is therefore considered unlikely to have a significant impact on this species.

4 Assessment of Impacts

This section responds to Item 4 of the PD request which requires the proponent to provide an assessment to clarify the extent and nature of potential impacts on the listed threatened species and ecological communities as a result of the proposed action that are likely to be present at, and in the vicinity of, the project site.

4.1 Intended Land Uses

Item 4.1 advises that the PD must ***“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.”***

The referral area is located within the RVPDA where the greater landscape is transitioning to urban environment, which is earmarked to continue. PDA's are precincts of land throughout Queensland, identified for specific accelerated development with a focus on economic growth. PDAs aim to provide for growing communities across the region to reduce costs associated with housing, transport and living, and increasing levels of congestion.

The referral area is located within the 'Urban Living' zone of the RVPDA which is intended to be developed as urban and suburban neighbourhoods focused on identifiable and accessible centres and comprising of a mix of residential developments and to accommodate a wide range of other non-residential uses, which includes education establishments.

The proponent seeks to clearing vegetation within the referral area to facilitate the construction of a school. This will involve the clearing of 19.1 ha of vegetation on-site.

4.2 Maps and GIS of the impact area

Item 4.2 of the PD request to ***“Include current maps and coordinates/shapefile of the proposed impact area and areas of habitat for MNES proposed to be retained. 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.”***

All figures and plans have been included as an attachment to the document (refer to **Section 12**) and referenced where necessary throughout the document. **Plan A1** demonstrates the development footprint.

The action proposes to remove all vegetation within referral area to facilitate the construction of development pad for a school as per Education Queensland requirements.

4.3 Confirm the area of habitat directly and indirectly impacted

Item 4.3 of the PD requests asks to ***‘Confirm the area of habitat that will be directly and indirectly impacted by the proposed action, including but not limited to areas where:***

- a. Connectivity to surrounding habitat will be retained, removed or functionally lost.***
- b. Adjacent habitat will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence).***

4.3.1 Direct Impacts

This section confirms the area of habitat that will be directly and indirectly impacted by the proposed action.

4.3.1.1 Vegetation Communities

The proposed action will be entirely located within the referral area and will require the removal of approximately 19.1 ha of remnant vegetation that is considered habitat critical to the survival of the koala and potential foraging habitat for the Grey-headed Flying-fox. The referral area forms part of Lot 901 on SP317868, where the remainder of the parent lot has been approved under a separate EPBC Referral (EPBC 2017/8095).

Due to the relatively small impact area and proposed land use, the action does not propose to provide retained habitat or connectivity. Additionally, the referral area adjoins a mapped waterway to the west, which is intended to be retained as a corridor providing connectivity within the locality and wider landscape.

A breakdown of vegetation to be impacted is provided in **Table A10 (Plan A1)**.

Table A10: Direct Impact to Vegetation Communities

Assessment Unit	Category	Regional Ecosystem	Remove (ha)	Retain (ha)
AU1	Category B	12.9-10.2	19.1	0

4.3.1.2 Habitat

The proposed action will impact Category B (remnant) vegetation which provides habitat values for a range of native flora and fauna species. A risk of impact to MNES identified as having a greater likelihood of occurrence has been prepared to determine the risk of potential project related impacts upon each matter (refer to **Table A11**).

The risk of impact assessment is qualitative and based upon the potential extent of habitat loss resulting from the construction phase of the project and to a lesser degree the operational phase of the project. It considered, but was not limited to the following:

- The value of the impacted habitat to each respective matter;
- The amount of habitat to be directly impacted (lost) against that to be retained;

- Potential indirect impacts (e.g. dust, noise and soil erosion);
- Potential fragmentation of a population into two or more populations;
- Increased fragmentation of wildlife corridors in the Referral area;
- Risk of operational impacts (e.g. noise); and
- Each species ability (e.g. fauna) or inability (e.g. flora) to move away from areas of direct impact into retained habitat

Table A11: Impact Risk Assessment

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence	Risk of Impact
Threatened fauna species				
<i>Phascolarctos cinereus</i>	Koala	Vulnerable	Known Suitable Koala habitat is present on-site in the form of mapped Category B (remnant) vegetation. Koalas have been recorded within the greater landscape. Evidence of Koala in the form of scats was recorded during field surveys and this species has been recorded within proximity to the referral area.	Yes
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	Vulnerable	Moderate There are no observed roosts on-site, with the nearest known roost site located in Yamanto (479), approximately 3.28 km north-west of the referral area (refer Plan A7) as well as 17.94km south west of the Nationally Important GHFF Roost located at Mt Ommaney (400). Given the site's proximity to a significant roosting site the referral area is considered to provide potential foraging habitat for this species.	Yes – foraging habitat
<i>Petauroides volans</i>	Greater Glider	Vulnerable	Low – Unlikely As discussed, the referral area is mapped entirely as Category B (remnant) including Least Concern Regional Ecosystem (RE) 12.9-10.2 with small areas of 'Of Concern' RE 12.9-10.7. Both of these REs are considered habitat for the Greater Glider with the 'Guide to greater glider habitat in Queensland' (Eyre 2022). As previously discussed, results of field surveys demonstrated that large trees in Assessment Unit 1 accounted for 37.5% compared to benchmark for Regional Ecosystem 12.9-10.2. This demonstrates a lack of large, potentially hollow bearing trees to support Greater Gliders. Also, fauna spotter catcher reports demonstrated that Greater Gliders did not inhabit the balance of the Hayfield Estate.	No

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence	Risk of Impact
			Due to the level of historical modification, fragmentation and lack of large trees, the species is not expected to utilise the subject site.	
<i>Lathamus discolor</i>	Swift Parrot	Critically Endangered	Low - Unlikely This species was not identified within the referral area. Additionally, a review of Queensland Government WildNet and Atlas of Living Australia records for the species identified the closest record is 9.6 km south west, identified at Purga. Field surveys identified two (2) preferred foraging species <i>Corymbia citriodora</i> (Spotted Gum) and <i>Eucalyptus tereticornis</i> (Forest Red Gum) within the referral area. However, due to historical modifications, the site lacks suitable large diameter trees that are preferred. While there is potential that the Swift Parrot to utilise the vegetation within the referral area, it is not considered that the referral area to contribute to important habitat for the species. Additionally, the significant foraging vegetation is provided within the surrounding landscape and in particular the Flinders Karawatha Corridor. Although two (2) preferred foraging species were identified within the referral area, there is a low potential that the Swift Parrot would utilise onsite vegetation, given the lack of nearby records and on-site floristic diversity.	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	Critically Endangered	Low This species was not identified during field surveys. The closest record is located approximately 4.8km south of the site. A total of 15 observations within 10km of the subject site. The referral area contains remnant vegetation dominated by eucalypt and <i>Corymbia</i> species, particularly <i>Corymbia citriodora</i> (Spotted Gum). This species relies on vegetation with diversity of species and abundance of mistletoe for food resources throughout the year. Field surveys identified two (2) preferred foraging species <i>Corymbia citriodora</i> (Spotted Gum) and <i>Eucalyptus tereticornis</i> (Forest Red Gum) within the referral area, however no mistletoe was recorded. Regent Honeyeaters experience competition from aggressive species such as Noisy Miner (<i>Manorina melanocephala</i>) and Noisy Friarbird (<i>Philemon corniculatus</i>). Both of which were observed to be utilising the vegetation within the referral area, which may reduce potential for Regent Honeyeaters to opportunistically forage within the referral area. Overall, while	No

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence	Risk of Impact
			there is potential for the Regent Honeyeater to utilise the vegetation within the referral area, it is considered unlikely as a result of historical disturbances and competition from other more aggressive species.	

4.3.1.3 Connectivity

The referral area is bound by the approved Ripley Road Development (EPBC 2017/8095) residential development to the west and south, CLAG Pty Ltd Ripley View Subdivision (EPBC2020/8615) with rural residential properties to the east that are located outside of RVPDA. The properties immediately adjoining the site to the west and to the north and west remained vegetation but are earmarked for development, with one project approved and the other in the Further Information Request Stage which is likely in the process of obtaining approvals and will eventually be cleared. Another fifteen (15) EPBC Act approvals exist over properties within the wider landscape which are under various stages of development (refer **Section 3.2.1** and **Plan A2**).

Portions of the referral area and adjoining properties have been subject to historical broad scale clearing. Currently, the referral area remains vacant and dominated by remnant vegetation comprising of predominantly *Eucalyptus* and *Corymbia* species. Connectivity throughout the referral area is largely maintained and connected to vegetated properties surrounding the referral area, although earmarked for future development.

As discussed, the proposed action will remove approximately 19.1 ha of vegetation removing all vegetation across the subject site. No connectivity is proposed within the referral area, with the loss of vegetation being offset.

4.4 Quantity and Quality of Habitat

Item 4.4 states the PD response must “**Confirm the quantity and quality of suitable habitat to be impacted within the proposed action area.**”

The proposed action will be entirely located within the referral area and will require the removal of approximately 19.1 ha of remnant vegetation that is considered habitat critical to the survival of the koala and potential foraging habitat for the Grey-headed Flying-fox.

4.4.1 *Phascolarctos cinereus* (Koala)

The referral area was determined to have Koala Habitat Assessment Tool (KHAT) score of 7 out of 10 and therefore is considered habitat critical to the survival of this species (refer **Part B – Referral Documentation**). To determine the quantum and quality of the habitat suitable for Koala on-site, vegetation/habitat quality was derived from the Modified Habitat Quality Assessment (MHQA) tool. 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 referral area.

The habitat quality scores for each assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A12**, **Table A13** and **Table A14** (refer **Attachment A6** for MHQA data). The site is comprised of one (1) assessment unit (**Plan A4**). The scores for Site Condition are derived directly from the MHQA tool data. These scores are then used to determine the scores for Quality and Availability of Food and Foraging Habitat, and Quality and Availability of Shelter. These scores are then used to determine the scores for Quality and Availability of Food and Foraging Habitat, and Quality and Availability of Shelter.

The referral area was given an overall weighted habitat quality score of **6.25** out of the total of 10 (rounded to a **6**) which is considered a moderate habitat quality score (refer **Table A13**). This score is calculated based on the average of the two habitat quality scores for the assessment unit. Applying this overall weighted habitat quality score (**6/10**) to the referral area the quantum impact is **11.46 ha**.

Modified Habitat Quality Assessment

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

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

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

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

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

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

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

4.4.1.1 Delineating Assessment Units

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

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

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

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

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

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

vegetation is often dominated by pasture grass (native or exotic) and weeds but can also include native regrowth.

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

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

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

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

4.4.1.2 Planning and Implementing Transects

Number and Location of Transects

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

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

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

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

Transect Layout

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

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

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

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

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

Condition Benchmarks

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

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

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

4.4.1.4 Site Condition Scoring (3/10)

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

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

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

Biocondition Attributes

Each condition attribute and the associated score when assessed against the relevant RE benchmark is provided in **Table A12**. Attribute scores are calculated at the AU level by using the average benchmark percentage across all transects in that AU. The total possible score for the 13 BioCondition attributes is 80 which accounts for 50% of the overall site condition score.

Table A12: Koala site condition scoring attributers (BioCondition Manual)

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

Site condition attribute	Scoring and benchmark percentage			
(6) Tree canopy height	Benchmark	<25%	≥25-70%	≥70%
(7) Tree canopy cover	Score	0	2	3
	Benchmark	<10%	≥10%-<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
	Benchmark	<10%	≥10-50%	≥50-90%
(10) Organic litter	Score	0	3	5
	Benchmark	<10%	≥10%-50% or ≥200%	≥50-<200%
(11) Large trees	Score	0	5	10
	Benchmark	0%	0-50%	≥50-100%
(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
	Benchmark	>50%	≥25-50%	≥5-25%

Quality and Availability of Food and Foraging Habitat

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

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

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

Koala food trees abundance is calculated at each transect by counting all Koala food trees (Eucalypt, *Corymbia* and *Angophora* species) with a DBH >100 mm within a 100 m x 20 m plot running 10 m either side of the centre line of the transect. The count is multiplied by 5 to produce a stem density per hectare, which is averaged across the assessment unit. The count is then compared to the average stem density per hectare identified in the regional ecosystem technical descriptions (Ryan 2019 - additional description for RE 12.9-10.2 provided by the Queensland Herbarium). Where the technical description provides stem densities for multiple tree strata, only the T1 and T2 strata are to be utilised as they will form the canopy and primary food source for koala. A score out of 8 is calculated as follows:

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

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

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

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

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

Quality and Availability of Shelter Habitat

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

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

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

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

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

which is averaged across the assessment unit. The count is then compared to the average stem density per hectare identified in the regional ecosystem technical descriptions (Ryan 2019 - additional description for RE 12.9-10.2 provided by the Queensland Herbarium). Where the technical description provides stem densities for multiple tree strata, only the T1 and T2 strata are utilised as they will form the canopy and primary food source for koala. A score out of 6 is calculated as follows:

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

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

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

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

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

4.4.1.5 Site Context (3/10)

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

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

Identifying Koala Habitat for Site Context

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

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

Size of Patch

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

Patch size is measured at the koala AU level with dispersal habitat not considered to be part of a patch, however it can provide connectivity between other areas of a patch. Size of patch is scored out of 10 as follows (refer **Plan A5**):

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

Connectedness

Connectedness relates to the capacity that the species have to disperse through the landscape. This attribute is calculated using GIS by measuring the length of koala habitat along the boundary of the site, calculated as a percentage. Connectedness is scored out of five as follows (**Plan A5**):

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

- >75% of the boundary - 5/5

Context

The context score is calculated using GIS to quantify the amount of vegetation immediately surrounding the assessment site. It is measured as the percentage of koala habitat within a 1 km radius of the site. Context is scored out of five as follows (**Plan A5**):

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

Ecological Corridors

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

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

Role of Site Location to species Overall Population in the State

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

- Not likely to be critical for species survival – 1/5
- Likely to be critical for species survival – 4/5
- Known to be critical for species survival – 5/5

Threats to the Species

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

- Clearing for development;
- Creation of a barrier to movement;

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

The highest threat level is given to a site if it isolated from other Koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1,500 m of the site boundary. A risk matrix relative to the conservation advice for the Koala is applied to determine threats to species. The matrix is provided as **Table A13** and described below:

- Habitat loss is considered 'Very High Risk' under the Koala conservation advice. Clearing and degradation of habitat is scored Low, Moderate and High and weighted according to risk factor relative to the expected threat score for each (summed vertically as 15 for Low, 7 for Moderate or 1 for High).
- High intensity bushfire is considered 'Very High Risk' under the Koala conservation advice. Inappropriate fire regimes is scored Low, Moderate and High relative to the implementation of an endorsed bushfire management plan and fuel load weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
- Vehicle strike is considered 'Moderate Risk' under the Koala conservation advice. Vehicle strike is scored Low, Moderate and High relative to the presence and status of nearby roads (major road = highway or connector, minor road = local or private) and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
- Dog attack is considered 'Moderate Risk' under the Koala conservation advice. Dog attack is scored Low, Moderate and High relative to the presence of dogs and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
- Overall threats are scored either a one, seven or 15 for high, moderate and low respectively (refer also **Plan A6**).

Table A13: Koala Threat Scoring Matrix

Metric	Low	Moderate	High
Threat Thresholds			
Clearing and Degradation of Habitat High Risk	One of the following applies to the site: 1. A legally binding protective mechanism. 2. Conservation zoning where clearing is not permitted. 3. If $\leq 30\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: $>30\%$ and $<70\%$ of the area within a 5km buffer of the site is cleared or disturbed land.	One of the following applies to the site: 1. The site is zoned for development. 2. If $\geq 70\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.

Metric	Low	Moderate	High
Score Weighting	6	2.8	0.4
Inappropriate Fire Regimes High Risk	A government endorsed Bushfire Management Plan (BMP) including specific measures for protecting koala habitat is in effect.	Moderate potential bushfire risk identified by State or Local government within or adjacent (<100m) the site. OR A site-specific BMP is in effect.	High or very high bushfire risk identified by State or Local government within or adjacent (<100m) the site.
Score Weighting	6	2.8	0.4
Vehicle Strike Moderate Risk	Located more than 1km from a major road AND Fauna safe design features in place between the site and any minor roads within 500m	Located <500m from a major road with fauna safe design features) OR Located <1km from a major road accessible for koalas (no fauna safe design) OR Minor roads servicing residential or industrial areas are located within 500m	Located <500m from a major road accessible for Koala (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m
Score Weighting	1.5	0.7	0.1
Dog Attack Moderate Risk	No dogs recorded on or adjacent to the site OR A government endorsed pest management plan is in place with completion criteria targeting no dog recordings.	Dogs recorded on site but adequate refuge for Koalas (>70% canopy cover).	Dogs recorded on site and limited refuge for Koalas (<70% canopy cover)
Score Weighting	1.5	0.7	0.1
Threshold Analysis	≥10	>4 and ≤10	≤4
MHQA Score	15	7	1

Species Mobility Capacity

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

The Guide to Determining Terrestrial Habitat Quality version 1.2 scores this attribute based on the presence and severity of factors that would contribute to a reduction in the mobility of the species. The scoring is based on a percentage reduction of mobility ranging from minor restriction (0-25% reduction) to severely restricted (76-100%). A score of 1, 4, 7 or 10 may be attributed depending on the level of restriction. Score categories are summarised in **Table A14**.

Table A14: Species Mobility Scoring Categories

Restriction	Score
Severely restricted (76–100% reduction)	1

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

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

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

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

While the guideline identifies features that restrict mobility, they are not attributed a category of restriction. A literature review has been completed to identify which features would be considered to have the potential to be a severe, high or moderate restrictions to dispersal. The outcomes are summarised in **Table A15**. It is of note that recent studies have found that koalas spend very little time on the ground, yet ground movement is disproportionately risky (vehicle strike/dog attack), reinforcing the importance of impediments that force ground travel such as clearing gaps, major roads and wide waterways (Rus et al. 2021; McAlpine et al. 2006).

Table A15: Restriction to Dispersal

Impediment	Primary Effect on Mobility	References
Habitat Loss & Fragmentation	koalas are strongly affected by habitat loss/fragmentation and reduced functional connectivity, with fragmentation linked to changes in movement and space use, and to reduced occurrence as patch isolation increases.	Rhodes et al. 2006 McAlpine et al. 2006 Youngentob 2021 Rus et al. 2021
Roads & Vehicle Traffic	Roads act as hard physical barriers; vehicle strikes kill dispersing koalas. Roadkill risk occurs across road classes and scales.	Rhodes et al. 2006 Lunney et al. 2002

Impediment	Primary Effect on Mobility	References
Fencing & Small-Scale Infrastructure	Fences can prevent koalas from reaching adjacent habitat patches, particularly when too high or lacking climbable surfaces.	NSW Department of Planning and Environment (2022) McAlpine et al. 2006
Human Disturbance	Koalas and other small mammals tend to avoid habitats close to construction sites, recreational areas such as bike paths and parks and other human activities. If major anthropogenic disturbance is located adjacent the site, it is considered a high barrier to dispersal.	McAlpine et al. 2006 Blickley and Patricelli 2010
Dense weed infestation	Weed invasion alters vegetation structure, reduces habitat quality, and can significantly influence how koalas move through the landscape. A dense weed infestation is defined as at least 50% cover.	NSW Department of Planning and Environment (2022)
Waterways	Waterways can impede koala movement primarily by creating physical gaps in canopy connectivity, forcing koalas to travel on the ground where they are more vulnerable to predation and vehicle strikes. Large waterways (>40 m wide) are considered a significant barrier because they isolate habitat patches and reduce safe dispersal routes.	Rhodes et al. 2006 McAlpine et al. 2006

Species mobility capacity is calculated using the following method:

- A 1 km buffer from the site boundary is used as the boundary to describe landscape permeability.
- The site is split into four quadrants (north, east, south and west).
- Each quadrant will be reviewed using a combination of desktop and field assessment to identify if any restriction to mobility.
- For each quadrant, assign a single mobility reduction score using the worst (highest) severity impediment present in that quadrant:
 - No or any minor restriction – 0%
 - Any moderate restriction – 40%
 - Any high restriction – 65%
 - Any severe restriction – 90%

The mobility reduction in each quadrant is assigned using the guidance set out in **Table A16**. Reduction scores must be supported by site specific information including at a minimum:

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

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

$$\text{Overall mobility reduction (\%)} = (QN + QE + QS + QW) / 4$$

A score is then allotted according to the mobility restriction severity scoring from the Guide to Determining Terrestrial Habitat Quality Version 1.2 (**Table A14**).

Table A16: Mobility reduction Guidance

Impediment	Minor / No Restriction	Moderate Restriction	High Restriction	Severe Restriction
Habitat fragmentation	Continuous or near-continuous canopy linkage across the quadrant; cleared gaps are small and have multiple treed stepping-stones.	Noticeable clearing creates large (>200m) and repeated canopy gaps that potentially force occasional ground travel; movement corridors exist but are constrained.	Extensive clearing or hostile matrix (e.g., intensive/agricultural or hardstand dominance) leaving only narrow/isolated treed lines.	Quadrant is effectively isolated from other habitat patches (large open/hostile matrix) such that safe dispersal routes are minimal; likely forces prolonged ground movement.
Roads & vehicle traffic	Local/low-traffic roads with frequent safe crossing opportunities and good verge tree cover.	Collector roads or moderate traffic where crossings are possible but risky; limited safe crossing structures.	Major arterial roads/high traffic where crossings are infrequent; underpasses/overpasses absent or poorly placed.	Multi-lane/high-traffic barrier road(s) dominating the quadrant such that they function as a hard barrier and/or strongly elevate mortality risk.
Fencing & small-scale infrastructure	Wildlife-permeable fencing (e.g., pass-under/over opportunities), discontinuous or low coverage.	Continuous fencing segments but with frequent permeability features (gaps/ramps/trees bridging).	Long continuous non-climbable fencing (e.g., solid barriers) or dense small infrastructure constraining movement pathways.	Near-continuous barrier fencing networks (often urban/residential interface) that effectively block passage between habitat elements.
Human uses / disturbance	Low intensity use; limited disturbance footprint; habitat adjacent remains quiet/low risk.	Regular human activity (tracks, recreation) causing some avoidance; still passable.	High human activity (e.g. construction, industrial edges) creating strong avoidance zones.	Dominant urban/industrial land use adjacent to habitat such that movement is highly constrained and risk elevated.
Dense weed infestations	Sparse weeds; understorey does not block movement lines.	Dense weed patches locally constrain movement lines (operationally, ≥50% cover in key strips).	Dense weeds widespread across likely movement corridors, strongly reducing permeability and/or access to trees.	Dense weeds and clearing/other barriers combine to leave few passable routes.
Waterways)	No major waterways, or narrow waterways with frequent canopy linkage/bridging points.	Waterway present but typically crossable at narrower points or with adjacent canopy connections.	>40 m wide waterway present with limited canopy linkage, forcing detours/ground travel.	Multiple >40 m channels or a major river barrier dominating the quadrant; crossings rare and risky.

4.4.1.6 Species Stocking Rate

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

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

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

- Species presence on or adjacent to the site – Evidence may be direct in the form of observation of Koalas, or indirect via the presence of scats. A range of methods should be employed to confirm species presence including scat meanders and targeted searches with a high probability of detection; such UAV drone surveys. A combination of methods produces a higher reliability of data when extrapolating koala density.
- Species usage of the site (habitat type and evidenced usage) – Species usage is scored based on the AU site condition score as follows:
 - 0 = not habitat
 - 0 and $< 1/3$ = low availability of foraging or breeding habitat
 - $1/3$ and $< 2/3$ = moderate availability of foraging or breeding habitat
 - $2/3$ = high availability of foraging or breeding habitat

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

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

For subjective criteria where it is unclear whether a particular attribute score is achieved, the precautionary approach is applied to favour the higher score. **Table A17** outlines the attributes utilised to assess species stocking rate.

Table A17: Koala Species Stocking Rate Scoring

Attribute	Scoring and criteria				
<i>Presence detected on or adjacent to site (neighbouring property with connecting habitat)</i>	Score (/10)	0	5	10	
		No	Yes – adjacent to site	Yes – on-site	
<i>Species usage of the site (foraging and breeding habitat availability)</i>	Score (/15)	0	5	10	15
		Not habitat	Low	moderate availability	high availability
<i>Approximate density (per ha)</i>	Score (/30)	0	10	20	30
		0%	Low	Medium	High
<i>Role/importance of species population on site*</i>	Score (/15)	0	5	10	15
		0	5-15	20-35	40-45
<i>Total SSR</i>	/70				
<i>SSR Score</i>	/4				

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

4.4.1.7 Discussion

Site Condition (30%)

The site is mapped entirely as remnant habitat with one 'Least Concern' RE 12.9-10.2 accounting for 18.55 ha and one 'Of Concern' Composite RE 12.9-10.2/12.9-10.7/12.9-10.16 accounting for 0.55 ha, with the 'Of Concern' Composite RE is less than 1 hectare and is indicative of RE 12.9-10.2, therefore, the site contains only one (1) Assessment Unit. Two transects were completed in AU1 while due to the small area of the 'Of Concern' Composite RE observation points were taken. Assessment Unit 1 scored a total of **2.47** out of **3** (refer **Table A18**).

As discussed, the outlined attributes are used to determine the scores for Quality and Availability of Food and Foraging Habitat, and Quality and Availability of Shelter. The vegetation on-site in AU1 scored a **40** out of **40** for each of the value (refer **Table A21** and **Table A22**).

Site Context (30%)

The site scored a Site Context with a score of **1.50** out of 3 (**Plan A5**).

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 habitat critical to the survival of the Koala connected to the referral area in this instance. This attribute is scored such that it reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS and determined the referral area to be part of a patch size of >1,000 ha due to the retained vegetation to the east. This component was assigned a score of **10** out of **10** (**Plan A5**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected to adjacent native vegetation. Connectedness relates to the capacity of the species to disperse through the landscape between sustainable patches of habitat, and therefore has important implications for species persistence. Connectedness was calculated using GIS, with the percentage of referral area boundary length supporting a Koala critical habitat connection off and on site was calculated at 62.8%, and consequently this attribute scored a **4** out of **5** as per the *Queensland BioCondition Assessment* methodology (**Plan A5**).

Context

The context attribute refers to the amount of habitat critical to the survival of the Koala located within a 1 km buffer of the referral area being assessed and is calculated using GIS. Habitat critical to the survival of the Koala within a 1 km buffer of the referral area was calculated at 49.1%, and therefore the context attribute achieved a score of **4** out of **5** as per the *Queensland BioCondition Assessment* methodology (refer **Plan A5**).

Ecological Corridors

A score of **zero (0)** was given to the Ecological Corridors component, as the referral area is not located within an Ecological Corridor or corridor buffer area.

Role of site location to species overall population in the State

This attribute aims to quantify the geographical importance of the referral area for Koala populations across the broader State. This attribute achieved a score of **5** out of **5** as the Department determined that referral area contains habitat critical to the survival of this species and received a score of 7 out of 10 against the KHAT.

Threats to the species

The 'threats to the species' attribute quantifies potential risks to the survival of Koala existing within and adjacent to the referral area. Key known threats to the survival of the Koala include proximity to linear

infrastructure (road and rail) increasing the risk of mortality and injuries, as well as predation by wild or domestic dogs. The highest threat level is given to a site if it is isolated from other Koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1500 m of the site boundary.

The proposed subject site is located approximately 100 m east of the existing Hayfield Estate. In addition, the large lot residential properties are located to the south and east. Due to the proximity of the subject site to the existing residential development, there is a high threat level of vehicle strike and dog attack. A threat score of **1** out of **15** was recorded as per the outlined methodology (refer **Table A23**).

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. Grey-headed Flying-fox and avi-fauna for example are considered highly mobile species due to their ability to fly quickly and over land barriers such as highly frequented roads or residential developments. Conversely, the Koala is considered a relatively immobile species due to it being an arboreal species, moving relatively slowly and hence its vulnerability to threats on-ground as outlined above.

In this instance, the species mobility capacity for the Koala on-site was assigned a score of **4** out of **10** as per the methodology outlined (refer **Table A24**).

Species Stocking Rate (40%)

The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. A species stocking rate score of 40 out of 70 was attributed to the site equating to a score of **2.29** out of **4** (refer **Table A19** and **Table A20**).

To summarise, the proposed action is considered to only impact on average quality Koala habitat and not the species or an important population, having a total weighted impact of **6.25 out of 10 (rounded to a 6)**. Substantial avoidance, management and mitigation measures are considered to result in a reduced impact on Koala habitat in the context of the RVPDA.

Table A18: Modified Habitat Quality Assessment Results – AU1

	RE12.9-10.2 Benchmark	Transect 1	Transect 3	Average of Transect(s)	% Benchmark	Score
<u>SITE CONDITION</u>						
Recruitment of woody perennial species in EDL	100	60	40	50.00	50	3
Native plant species richness - trees	6	8	6	7.00	116.67	5
Native plant species richness - shrubs	7	6	4	5.00	71.43	2.5
Native plant species richness - grasses	7	6	6	6.00	85.71	2.5
Native plant species richness - forbs	13	5	7	6.00	46.15	2.5
Tree canopy height (Canopy)*	21	16	16	16.00	76.19	5
Tree canopy height (Sub-canopy)*	12	7	7	7.00	58.33	3
*Average tree canopy height						4
Tree canopy cover (Canopy)**	64	32.1	64.8	48.45	75.70	5
Tree canopy cover (Sub-canopy)**	20	17.7	20.7	19.20	96.00	5
**Average tree canopy cover						5
Shrub canopy cover	6	4.1	13.1	8.60	143.33	5
Native grass cover*	21	19	78	48.50	230.95	5
Organic litter*	48	63	32	47.50	98.96	5
Large trees (euc plus non-euc) (per ha)	38	12	6	9.00	23.68	5
Coarse woody debris (per ha)	506	200	210	205.00	40.51	2
Non-native plant cover	0	10	10	10.00	10.00	5
Quality and availability of food and foraging habitat	NA			40	-	40
Quality and availability of shelter	NA			40	-	40
Site Condition Score (/160)						131.50
Overall Site Condition Score - out of 3						2.47
<u>SITE CONTEXT</u>						
Size of patch	10			10		10

Connectedness	5		4		4
Context	5		4		4
Ecological Corridors	6		0		0
Role of site location to species overall population in the state	5		5		5
Threats to the species	15		1		1
Species mobility capacity	10		4		4
Site Context Score (/56)					28
Overall Site Context Score - out of 3					1.50
SPECIES STOCKING RATE					
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70		40		40
Species Stocking Rate Score (/70)					40.00
Overall Species Stocking Rate Score - out of 4					2.29
Overall Assessment Unit Score					6.25

Table A19: Species Stocking Rate Results

Species Stocking Rate (SSR) Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 – SAT Surveys detected low Koala usage on-site
Species usage of the referral area (habitat type and evidenced usage)	15/15 – Scats indicate Foraging and Breeding
Approximate density (per ha)	10/30 – SAT surveys detected low usage
Role/importance of species population on site*	5/15 (refer Table A18)
Total Species Stocking Rate Score	40/70
SSR Score – out of 4	2.29

Table A20: SSR supplementary table

SSR Supplementary Table	
*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
Score	5/45

Table A21: Foraging Scoring

AU		1
Stems		
Transect	1	3
Stem Count	78	68
Stems/ha	390	340
Mean S/ha	365	

AU	1
Benchmark	240
%Benchmark	152.08
Stem Score	8
Cover	
%Benchmark	75.70
Cover Score	2
Foraging Total	10
Foraging Score	40

Table A22: Shelter Scoring

AU	1	
Stems		
Transect	1	3
Stem Count	78	68
Stems/ha	390	340
Mean S/ha	365	
Benchmark	240	
%Benchmark	152.08	
Stem Score	6	
Large Trees		
%Benchmark	23.68	
Large Tree Score	2	
Shelter Total	8	
Shelter Score	40	

Table A23: Threats Matrix Scoring

Metric	Low	Moderate	High
Clearing and Degradation of Habitat	Apply one of the following options in order of priority: 1. Apply a current legal protective mechanism. 2. The site is zoned for conservation purposes or clearing is not permitted. 3. If $\leq 30\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: $>30\%$ and $<70\%$ of the area within a 5km buffer of the site is cleared or disturbed land.	Apply one of the following options in order of priority: 1. The site is zoned for development 2. If $\geq 70\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.
Score Weighting	6	2.8	0.4
Inappropriate Fire Regimes - Very High Risk	Current Government endorsed Bushfire Management Plan (BMP) including specific measures to protect the Koala is in effect.	Moderate potential bushfire risk identified by State or Local government within or adjacent to ($<100\text{m}$) the site. OR A site-specific BMP is in effect.	High or very high bushfire risk identified by State or Local government within or adjacent to ($<100\text{m}$) the site.
Score Weighting	6	2.8	0.4

Metric	Low	Moderate	High
Vehicle Strike - Moderate Risk	Located more than 1km from a major road AND Fauna safe design features in place between the site and any minor roads within 500m	Located <500m from a major road with fauna safe design features) OR Located <1km from a major road accessible for koalas (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m	Located <500m from a major road (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m
Score Weighting	1.5	0.7	0.1
Dog Attack - Moderate Risk	No dogs recorded on or adjacent to the site OR A government endorsed pest management plan is in place with completion criteria targeting no dog recordings.	Dogs recorded on site and adequate refuge for Koalas (>70% canopy cover).	Dogs recorded on site and limited refuge for Koalas (<70% canopy cover)
Score Weighting	1.5	0.7	0.1
Threats to Species			
Threshold Analysis	≥10	>4 and <10	≤4
Score	15	7	1

Metric	Low	Moderate	High
Description	Low threat level (i.e. likely to survive)	Moderate threat level	High threat level (i.e. likely to result in death, irreversible damage)
Final Score	3		
Final Treat Level Score	1		

Table A24: Mobility Scoring

Quadrant	Description	Rating	%
North	Major highway	Severe restriction	90
East	Low traffic road and rural residential properties	Minor restriction	0
South	Ripley Road and residential clearing and development	High restriction	65
West	Major highway	Severe restriction	90
Average			61.25
Score		High restriction	4

4.4.2 *Pteropus poliocephalus* (Grey-headed Flying-fox)

The proposed action results in the clearing of 19.1 ha of vegetation that is identified as providing suitable foraging habitat for the Grey-headed Flying-fox. The impact and the retention sites have been assessed using the FHA tool developed by Saunders Havill Group 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 Grey-headed Flying-fox foraging habitat.

The traditional terrestrial habitat quality assessment assesses three core indicators—site condition, site context and species habitat index. The FHA tool combines the aspects of the three core indicators and published scientific literature into two (site condition and site context) with site condition being weighted the highest as foraging habitat is impacted 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 FHA tool is focussed on ‘foraging habitat’ rather than (presence/absence of the species). This assessment of ‘foraging habitat’ for species stocking rate has been incorporated in the FHA tool as a camp or species presence was not observed on-site, however, potentially 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 FHA. The scoring tables for the FHA are attached as **Attachment A7**.

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 range for a relatively undisturbed community.

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

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

Assessment methodology of the above condition characteristics is outlined below (refer **Table A25** for benchmarks):

- 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.
- 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 of 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.
- 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:

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

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*).

- 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 A19**.

- 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).
- Non-native plant cover – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. All non-native plant cover was assessed by estimating the percentage cover of exotic species over the 100 m X 20 m plot.

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

Table A25: FHA site condition scoring framework

1 Vegetation Condition	Score	5	10	20	
	Description	Category X	Category C	Category B	
2 Canopy species richness	Score	0	5	10	20
	Description	0 foraging species	1 – 3 foraging species	4 – 6 foraging species	>6 foraging species
3 Flower Score (average)	Score	2	5	8	10
	Description	0.01 – 0.25	0.26 – 0.50	0.51 – 0.75	0.76 – 1.00
4 Timing of biological shortages	Score				
	Description				
	Food shortages				
	Pregnancy and birthing				
	Lactation				
	Mating and conception				
	Migration paths				
	Fruit industries				
5 Quality of foraging habitat	Score	0	5	10	20
	Description	0 significant foraging tree species	1-3 significant foraging tree species	4-6 significant foraging tree species	>6 significant foraging tree species
6 Non-native plant cover	Score	0	5	10	20
	Description	> 50 % non-native plant cover	25 – 50 % non-native plant cover	5 – 25 % non-native plant cover	< 5 % non-native plant cover

Site Context (30%)

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

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

Assessment methodology of the above context characteristics is outlined below (refer **Table A26** for benchmarks):

- 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.
- Connectedness – This context characteristic is assessed by counting the number of active GHFF roosts within a 20 km radius of the site (over the past year of monitoring (11/19– 11/20)). For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government).
- 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.
- 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.
- 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

- *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 (over the past year of monitoring (11/19–11/20)) 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).

Table A26: FHA site context scoring framework

1 Size of Patch*	Score	0	2	5	7	10
	Description	<5ha	5-25ha	26-100ha	101-200ha	>200ha
2 Connectedness*	Score	0	3	6	10	
	Description	< 1 active Grey-headed Flying-fox camp within a 20 km radius	1 – 3 active Grey-headed Flying-fox camp within a 20 km radius	4 – 6 active Grey-headed Flying-fox camp within a 20 km radius	> 6 active Grey-headed Flying-fox camp within a 20 km radius	
3 Context*	Score	0	3	6	10	
	Description	< 10 % Grey-headed Flying-fox foraging habitat within a 20 km radius	10 – 30 % Grey-headed Flying-fox foraging habitat within a 20 km radius	31 – 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius	> 75 % Grey-headed Flying-fox foraging habitat within a 20 km radius	
4 Ecological corridors	Score	0	6	10		
	Description	Not within	Sharing a common boundary	Within (whole or part)		
5 Threats to species	Score	1	5	10		
	Description	High level threat to species	Moderate level threat to species	Low level threat to species		
6 Role of site location to species overall population in the state	Score	1	6	10		
	Description	1 – 2 active level 3 Grey-headed Flying-fox camp within a 20 km radius	3 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius	> 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius		

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) 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 A27**).

Table A27: Species Stocking Rate Scoring

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

Refer to **Table A25**, **Table A26** and **Table A27** for Benchmark Scoring. Results of the FHA using the methodology detailed above are provided in **Table A28**. The impact site attained a score of **5.85** out of **10** (refer **Plan A7**).

Table A28: GHFF MHQA

		Maximum Score	Assessment Unit - Regional Ecosystem	
			AU 1 Remnant (RE 12.9-10.2)	
Site Condition (40%)	Vegetation Condition	20	20	AU1 is mapped as Category B
	Species Richness	20	10	T1 – 7 GHFF Species <i>Acacia leiocalyx</i> <i>Alphitonia excelsa</i> <i>Angophora leiocarpa</i> <i>Corymbia citriodora</i> <i>Corymbia intermedia</i> <i>Corymbia tessellaris</i> <i>Eucalyptus crebra</i> <i>Eucalyptus tereticornis</i> <i>Jacksonia scoparia</i> <i>Lophostemon suaveolens</i> <i>Petalostigma pubescens</i>
	Flower Score	10	5	0.3582
	Timing of Biological Shortages	10	10	All Biological Shortages covered.
	Quality of Foraging Habitat	20	10	<i>C. citriodora</i> , <i>C. intermedia</i> , <i>E. crebra</i> and <i>E. tereticornis</i> are considered significant food trees.
	Non-native Plant Cover	20	10	10 % non-native plant cover.
	Site Condition Score	100	65	
	Site Condition Score - out of 4	4.00	2.60	
	Size of patch	10	10	The size of patch connected to the site is greater than 200 ha

		Maximum Score	Assessment Unit - Regional Ecosystem	
			AU 1 Remnant (RE 12.9-10.2)	
Site Context (30%)	Connectedness	10	10	There are 8 active Grey-headed Flying-fox camps within a 20 km radius of the site.
	Context	10	6	There is approximately 38 % of Grey-headed Flying-fox foraging habitat within a 20 km radius of the site.
	Ecological Corridors	10	0	The site is located outside a regional corridor.
	Role of site location to species overall population in the state	10	10	There are > 4 active Level 3 Grey-headed Flying-fox camps within a 20 km radius of the site.
	Threats to the species	10	5	There is a moderate level of threat to the species on and adjacent to the site.
	Site Context Score	60	41	
	Site Context Score - out of 3	3.00	2.05	
Species Stocking Rate (30%)	Foraging Tree Density		T1 - 390 per ha	T2 - 340 per ha
	Species Stocking Rate Score	10	4	
	Species Stocking Rate Score - out of 3	3.00	1.20	
Total			5.85	
AU Area (hectares)			19.1	
Weighting			1.00	
Score			5.85	

4.4.3 *Petauroides volans* (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. Field surveys found the habitat on-site to be largely unsuitable for this species and relatively fragmented, however, the site maintains characteristics that may be viewed as habitat critical to the survival of the species as per the conservation advice, namely, 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. The site does maintain eucalypt woodland made up of suitable foraging species, however, is relatively fragmented and lacking in more mature vegetation that might maintain hollows resources.

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 A8b depicts the current disturbance in and adjoining the site, including existing development to the north and west, roads either constructed or under construction to the east and north, and development further to the east. It is clear that the impact site has been subject to substantial disturbance from historical clearing (refer **Plan A8c**), noting these disturbed areas are now mapped by the State as remnant (refer **Plan A8d**). 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. This is apparent in the general lack of old growth trees with hollows recorded on the site. This is also reflected in the limited extent of mapped remnant vegetation adjoining the site (**Plan A8d**). As discussed above, this does not imply the area has never been cleared, rather it harbours trees that might meet remnant thresholds against the benchmarks for height and cover at the GIS scale.

Notably, the nearest records for the species within the last five years are 7.03 km to the south east and severely fragmented from the impact site by historical clearing, major infrastructure, urban development and a lack of contiguous remnant (refer **Plan A8e**). This is not unexpected given the high levels of disturbance and fragmentation in and surrounding the impact area. This is further apparent in mapping by Griffith University, Queensland, of relative forest age that shows the remnant portion of the site is considered mostly 'young' to 'young-intermediate' aged vegetation, with some relatively small patches of 'intermediate' and 'intermediate to mature' aged vegetation around the periphery (Refer **Plan A8f**).

With respect to likelihood that the site will provide habitat for the species into the future, the site and surrounds are slated for future development (refer **Plan A8g**) and it is noteworthy that the site is significantly fragmented by existing and approved development, including EPBC Act approved residential development sites and limited extant contiguous vegetation (**Plan A8g**). The RVPDA intends for the site and surrounds to be developed for urban uses (**Plan A8g**). In consideration of existing and future development in and adjoining the site, it site is not considered a suitable fragment for future colonisation by the Greater Glider.

Significant Impact Assessment

The following provides a significant impact assessment to understand the proposed actions potential impact on the Greater Glider.

Recovery Actions

The Greater Glider does not have an adopted National Recovery Plan published by the Commonwealth of Australia. The Conservation Advice lists Conservation and management priorities for the Greater Glider. The priorities include Habitat loss, disturbance and modification (including fire), climate change, invasive species and ex-situ recovery actions.

The plan of development needs to be viewed in conjunction with this assessment (**Plan A1**). An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. Lead to a long-term decrease in the size of an important population of a species.

Assessment: The species was not identified on-site during field survey effort. The subject site has been subject to historical clearing, resulting in the removal of mature trees across the majority of the referral area. Due to the historical logging completed across the site, the impact area lacks adequate suitable large trees to support the denning requirements of Greater Gliders. As detailed within the Greater Glider Conservation Advice, the species are sensitive to fragmentation, and despite having small home ranges, due to their low reproductive rate and sensitivity to disturbance, they are known to have become extinct in small, fragmented habitat patches (DCCEEW 2022). Further, Greater Gliders are known to be poor dispersers, particularly across vegetation that is not native forest, and do not readily recolonise isolated sites that have been lost (DCCEEW 2022).

Preclearance fauna spotter catcher reports completed for the Hayfield Estate to the west of the site (EPBC 2017/8095) (**Plan A9** and **Attachment A4**) demonstrated that no Greater Gliders were utilising the potential habitat to west of the site. It is considered unlikely due to the historical modification and disturbance in the greater area that Greater Glider would utilise the site now or into the future.

Further, the closest Greater Glider record is located approximately 4.44 km to the north of the site, although the record is not recent, from 1930. Greater Gliders have recently been recorded in White Rock Conservation Area, approximately 7.03 km to the south east.

Given the abundance of preferential habitat in the wider locality and the high levels of modification across the referral area and surrounding area, the significance of habitat is considered marginal.

Further, the Significant Impact Guidelines 1.1 describes an important population as population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: key source populations either for breeding or dispersal; populations that are necessary for maintaining genetic diversity, and/or; populations that are near the limit of the species range. Due to the lack of records surrounding the site, as the closest recent records are located approximately 7.03 km to the south east, the site or immediately adjoining is not

expected to contain a breeding or dispersal population or a population that is considered important for maintaining genetic diversity. Further, the site is not near the limit of the species range.

Therefore, 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.

2. Reduce the area of occupancy of an important population.

Assessment: The species was not identified on-site during field survey events. As previously discussed, the referral area has been subjected to historical modification and well as disturbance in greater area with residential and industrial land uses. Due to the historical and ongoing modification, the vegetation proposed to be impacted as a part of the action is not considered suitable habitat. This is further supported by the lack of large trees throughout the impact area, therefore the impact area lacks potential den trees for the species. In addition, due to the vegetation clearing to the west of the referral area as well as the fauna spotter catcher reports from during the vegetation clearing, Greater Gliders are not expected to occur within the impact site. Further, the species is known to be sensitive to disturbance, therefore it considered likely the species would avoid the impact area and a buffer to the impact area in its current state.

The species has been recorded within 10 km of the site, including 4 records located recorded by QLD's WildNet data. The species has not been recorded within 5 km of the referral area recently (from 1980 onwards). Due to the few records within 5 km and the species sensitivity to disturbances, the species is not expected to be present within the impact area nor immediately adjoining. Therefore, the action will not reduce the area of occupancy of the species.

3. Fragment an existing important population into two or more populations.

Assessment: The species was not identified on-site during extensive field survey effort and field surveys demonstrate a lack of large trees to provide potential den trees for the species. While the REs mapped on-site are considered Greater Glider REs, the level of disturbance, both historical and ongoing, across the impact site and approximately 80m to the west are considered likely to deter the species. Also, as previously discussed, due to the level of disturbance throughout the impact site and species sensitivity to disturbance and known to not readily recolonise, the species is not expected to utilise the impact site.

Further, the referral area is located in the north eastern portion of the RVPDA, with large lot residential and industrial land uses to the east outside of the RVPDA area. Therefore, given the level of disturbance through the greater landscape and the lack of records to the east of the site, the impact area is considered unlikely to fragment an existing population into two or more. A significant impact as a result of the proposed action is not likely.

4. Adversely affect habitat critical to the survival of a species

Assessment: Habitat Critical to the Greater Glider, as defined in the Greater Glider Conservation Advice (DCCEEW 2022) can be defined as large, contiguous areas of eucalypt forest which contain hollow-bearing trees and a diverse range of the species preferred food species, smaller or fragmented habitat patches connected to larger patches of habitat that can facilitate dispersal, cool microclimate forest/woodland areas, areas identified as refuges under future climate changes scenarios and post fire refuges.

As demonstrated in **Plan A2**, surrounding the referral area within the RVPDA, the land is shifting to low density residential, including current developments and land earmarked for development. Further, residential allotments and industrial areas are located to the east of the referral area. In addition, camera traps deployed in the referral area recorded *Vulpes vulpes* utilising the referral area, an assumed threat to displaced and dispersing Greater Gliders.

As previously discussed, the species is known to be sensitive to fragmentation and as identified in the Conservation Advice, the species is considered unlikely to recolonise areas where disturbance and fragmentation has occurred. As a result, it is considered very unlikely that the species would utilise the scattered mature trees present. Further, fauna spotter catcher reports from the adjacent Hayfield Estate Development (EPBC 2017/8095) demonstrated that no Greater Gliders were utilising the vegetation to the west of the site.

Recommendation 3 of the Guide to Greater Glider Habitat in Queensland suggests to 'improve reliability for indicating greater glider habitat or potential habitat by measuring the density of large trees' (DES 2022). When assessing the large trees per Assessment Unit AU1 accounted for only 37.5% of the benchmark. Therefore, it is considered unlikely the species would utilise the site, due to the lack of suitable, large trees to provide denning habitat.

Further, Recommendation 4 suggests that 'remnant patches of potential Greater Glider habitat should be valued as habitat regardless of patch size'. However, as previously discussed, due to the high level of historical disturbance and disturbance in the greater landscape, due to the species sensitivity to disturbance, the species is not expected to occur. Therefore, the development is not expected to adversely impact critical habitat. A significant impact as a result of the proposed action is not likely.

5. Disrupt the breeding cycle of an important population.

Assessment: The Greater Glider are highly reliant on large, hollow-bearing trees for breeding and shelter. Due to the modification across the referral area, particularly within the impact site, resulting in a lack of large, mature hollow-bearing trees, the removal of vegetation on-site is considered unlikely to reduce potential denning trees for the species.

As previously discussed, the closest contemporary records of Greater Glider are located approximately 7.03 km to the south east of the site. Therefore the removal of vegetation within the impact area will not affect any known records of Greater Gliders. Further, the retention of the vegetation within the northern portion of the site in the Conservation Area will reduce potential impacts to Greater Gliders that may be present within the

Flinders Karawatha Bioregional Corridor adjoining the site. A significant impact as a result of the proposed action is not likely.

6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Assessment: The potential habitat on-site was considered to be limited due to widespread historic clearing and lack of larger, mature, hollow-bearing trees within the proposed impact area.

Given the existing disturbance across the site and in the greater landscape, the removal of vegetation 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. Due to the level of historical and ongoing modification within the proposed impact area, it is considered likely that Greater Gliders would avoid vegetation close to the proposed impact area, therefore not contributing to a loss of potential habitat.

A significant impact as a result of the proposed action is not likely.

7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.

Assessment: 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. Further, *Vulpes vulpes* (European Red Fox) were recorded on-site, demonstrating an existing presence of invasive species that are known threats to Greater Gliders.

8. Introduce disease that may cause the species to decline, or

Assessment: The project is unlikely to introduce disease into the area, and therefore no significant impact is considered to result from the proposed action.

9. Interfere substantially with the recovery of the species.

Assessment: At the time of this draft version of the PD (2024), there is no adopted or made Recovery Plan for the Greater Glider. Within the Conservation Advice for Greater Glider (DCCEEW 2022), the recovery actions of the Greater Glider are generally around preventing impacts from fires to the species and the removal and fragmentation of habitat. The proposed action is not considered to interfere with the recovery of the species because the habitat located on-site within the proposed impact area is not considered significant. As discussed, the referral area has been subjected to historical modification, resulting in a lack of suitable, large mature trees to provide den trees for the species.

Hence, no significant impact is considered to result from the proposed action.

4.4.4 *Lathamus discolor* (Swift Parrot)

Swift Parrot 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.

Critical Habitat Analysis

Swift Parrot habitat, as defined in the National Recovery Plan for the Swift Parrot (Birds Australia 2011), includes vegetation communities and key tree species that provide important nesting and foraging habitat for the Swift Parrot. The use of the habitat is dependent on prevailing climatic conditions and corresponding food availability (Birds Australia 2011). The production of lerp and nectar food resources in these habitats and the availability of nesting hollows are considered the main limiting factors to the species' survival and capacity to breed (Birds Australia 2011).

In Queensland, the Swift Parrot's preferred food species include:

- *Eucalyptus macrocarpa* (Grey Box)
- *Eucalyptus albens* (White Box)
- *Eucalyptus melliodora* (Yellow Box)
- *Eucalyptus robusta* (Swamp Mahogany)
- *Eucalyptus tereticornis* (Forest Red Gum)
- *Eucalyptus pilularis* (Blackbutt)

In addition to the aforementioned species, in South East Queensland *Corymbia citriodora* (Spotted Gum) is considered a preferred foraging species. Results of the field surveys completed across the referral area only recorded two (2) preferred foraging species, being *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia citriodora* (Spotted Gum) specimens. As previously discussed, the referral area has been subjected to historical modification, which has resulted in a reduction in larger trees.

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 (Birds Australia 2011). Many of the Swift Parrot foraging sites in Queensland occur on 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. The site does not include Essential Habitat mapping for the species under the Vegetation Management Reports provided for the allotments by the Department of Resources (DOR).

As detailed in **Section 3.3.3.4**, 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 9 for AU1. 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 37.5% of the large tree benchmark for RE12.9-10.2.

As demonstrated in **Plan A10**, Swift Parrot records exist within 10 km of the referral area, located approximately 9.1 km to the south west within the suburb of Purga. Further, eBird mapping does not include the proposed referral area. Frequency mapping of 0-2% is located further to the west and east of the site towards Willowbank and Springfield.

Habitat critical to the survival of the Swift Parrot includes; those 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 (Birds Australia 2011).

Based on this assessment, the site is considered to contain marginal preferential foraging habitat due to the lack of abundance of large trees and preferred foraging species. The site contains a moderate to low percentage of trees defined as 'large' under the benchmark, indicative of level of disturbance 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

The following provides an assessment against the significant impact guidelines to identify the potential impact for the Swift Parrot.

Recovery Actions

The Swift Parrot has a National Recovery Plan published in 2024. The overall objective of the National Recovery Plan is to prevent further population decline of the Swift Parrot and to achieve a demonstratable sustained improvement in the quality and quantity of Swift Parrot habitat to increase carrying capacity. The following actions were designed to achieve the overall objectives of the National Recovery Plan:

- Action 1 – Identify the extent and quality of habitat;
- Action 2 – Manage and protect Swift Parrot habitat at the landscape scale;
- Action 3 – Monitor and manage the impact of collisions, competition and disease;
- Action 4 – Monitor population and habitat;
- Action 5 – Increase community involvement in, and awareness of, the recovery program; and
- Action 6 – Coordinate, review and report on recovery process.

The plan of development needs to be viewed in conjunction with this assessment (**Plan 1**). An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:

1. Lead to a long-term decrease in the size of a population

Assessment: 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 recent record of the species is located approximately 9.1 km to the south west of the referral area. Due to the sensitivity of the species, public data bases were used, and the exact location is not released. eBird range mapping does not identify the referral area as within the range for the Swift Parrot. The closest record is 9.1 km to the south west within the suburb of Purga, which is located within the eBird range mapping.

Overall, larger trees were lacking across the impact area due to the historic clearing that occurred throughout the referral area. 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.

2. Reduce the area of occupancy of the species

Assessment: The species was not identified on-site during field survey events. Further, the closest record is located approximately 9.1 km to the south west of the site in Purga. Further, eBird mapping, does not include the site within the range mapping for the species. Swift Parrots are known to consistently occupy breeding habitat in Tasmania and utilises habitat in Queensland opportunistically. The impact area associated with the proposed development is relatively small given the availability of intact vegetation within the wider locality, with the Flinders Karawatha Bioregional Corridor located approximately 7.45km to the south 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.

3. Fragment an existing population into two or more

Assessment: The species was not identified on-site during extensive field surveys completed across multiple years. As previously discussed, the closest record of the species is located approximately 9.1km to the south west within the suburb of Purga. Further, eBird range mapping for the species does not map the site within the species range.

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.

4. Adversely affect habitat critical to the survival of a species

Assessment: 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 than smaller, juvenile species.

Given the mobility of Swift Parrot, and the abundance of preferential habitat within the greater landscape within the Flinders Karawatha Corridor, 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.

5. Disrupt the breeding cycle of a population

Assessment: 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.

6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Assessment: The species was not identified on-site during field survey events. Further, as previously discussed, the site retains limited foraging habitat for the species, limited to scattered key tree species and 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.

7. Result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat

Assessment: 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.

8. Introduce disease that may cause the species to decline, or

Assessment: The project is unlikely to introduce disease into the area, and therefore no significant impact is considered to result from the proposed action.

9. Interfere substantially with the recovery of the species.

Assessment: 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 the Flinders Karawatha Corridor, where the species has been recorded previously. The proposed action area is not considered to provide preferential habitat. Therefore, no significant impact is considered to result from the proposed action.

4.4.5 *Anthochaera phrygia* (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. Surveys for the Regent Honeyeater have focused on identifying the availability of suitable foraging habitat on-site. Field surveys found the habitat on-site to be largely unsuitable for this species.

Critical Habitat Analysis

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)

- *Dendrophoe vitellina* (Long-flower Mistletoe)

In addition to these species, in South East Queensland, the species are known to have a preference for *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus pilularis* (Blackbutt) and *Corymbia citriodora* (Spotted Gum). 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).

Regarding the potential foraging habitat present across the referral area, the site contains limited preferred foraging species, which includes *Corymbia citriodora* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum). Further, as previously discussed, the site has been subjected to historical modification, resulting in a reduction of large, mature tree specimens to provide more productive nectar flows for the species.

As detailed in **Section 3.3.3.5**, the Regent Honeyeater prefers larger diameter foraging trees as they are more productive nectar sources. The site contains scattered trees defined as 'large' under the Queensland Herbarium Benchmark guideline. 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 9 large tree per hectare for AU1. 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 37.5% of the large tree benchmark for RE12.9-10.2.

Based on this assessment, the site is considered to contain marginal preferential foraging habitat due to the lack of abundance of large trees. The site contains a moderate to low percentage of trees defined as 'large' under the benchmark, indicative of regrowth, however, old growth and habitat trees that form primary habitat are mostly absent across the site as a result of historical clearing.

Due to the limited key tree species present within the referral area, limited to preferred species in South East Queensland that aren't listed in the Recovery Plan, as well as the lack of large trees present due to historical logging practices, it is considered unlikely that the referral area, particularly the impact site would provide suitable, reliable foraging for the species. Further, due to the Flinders Karawatha Corridor located approximately 7.45 km to the south east, this vegetation is considered to provide more suitable foraging habitat for the species due to large areas of vegetation that includes remnant status under the Vegetation Management Act 1999.

The species also faces increased competition from larger, more aggressive nectivores, such as the Noisy Friarbird (*Philemon corniculatus*), Red Wattlebird (*Anthochaera carunculata*) and the Noisy Miner (*Manorina melanocephala*) (DoE 2016). Field surveys completed across the referral area across multiple years observed both Noisy Friarbird (*Philemon corniculatus*) and the Noisy Miner (*Manorina melanocephala*) utilising the site. Due to the presence of both Noisy Friarbirds and Noisy Miners within the referral area, this would also decrease the likelihood of Regent Honeyeaters foraging on-site as the species are likely to be outcompeted and forced out of the referral area due to the Noisy Friarbird and Noisy Miners territorial behaviour.

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 A10** records of the species exist approximately 4.6 km to the south east. However, this record retains a spatial uncertainty of 2,000 m 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 located on-site, including both preferred foraging species and mature, more productive specimens. As such, the site is not considered to contain critical habitat for the species.

The following subsection provides a Significant Impact Assessment per the *Significant Impact Guidelines 1.1* for consistency and to further demonstrate the action will not result in a Significant Impact to the Regent Honeyeater.

Significant Impact Assessment

The following provides a significant impact assessment to understand the proposed actions potential impact on the Regent Honeyeater.

Recovery Actions

The Regent Honeyeater has a National Recovery Plan published by the Commonwealth of Australia (2016). The National Recovery Plan aims to reverse the long-term population trend of decline and increase the numbers of Regent Honeyeaters to a level where there is a viable, wild breeding population, even in poor breeding years, and to enhance the condition of habitat across the Regent Honeyeater range to maximise survival and reproductive success, and provide refugia during periods of extreme environmental fluctuation. The strategies to achieve these objectives are:

- Action 1 – Improve the extent and quality of Regent Honeyeater habitat;
- Action 2 – Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining;
- Action 3 – Increase understanding of the size, structure, trajectory and viability of the wild population; and
- Action 4 – Maintain and increase community awareness, understanding and involvement in the recovery program.

The plan of development needs to be viewed in conjunction with this assessment (**Plan A1**). An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:

1. Lead to a long-term decrease in the size of a population

Assessment: The species was not identified on-site nor as fly-over during field survey effort. Limited, potential foraging habitat was noted within limited to large, mature, more productive specimens the species are known to prefer. Species considered to provide potentially suitable foraging habitat include *Corymbia citriodora* and *Eucalyptus tereticornis*. Overall, larger trees were sparse across the site due to the reduction in mature, more productive

specimens as a result of historical clearing. Hence, the availability of preferred habitat on-site is limited. In addition, larger intact areas of remnant vegetation exist to the west of the site within the Flinders Karawatha Bioregional Corridor that are considered more likely to provide more suitable foraging.

While the closest record of the species is shown as approximately 4.65 km to the south east, this is a generalised point with a spatial uncertainty of 2,000m. Given the superior mobility capacity of the species, and abundance of preferential habitat in the wider locality, the significance of foraging habitat on-site, particularly within the impact site is considered marginal. 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 as a population or individual.

2. Reduce the area of occupancy of the species

Assessment: The species was not identified on-site during field survey events. The species has a patchy distribution, particularly in Queensland, where utilisation is considered opportunistic. eBird does map the referral area an area where the species is known to occur with eBird mapping with a 0-2% frequency. This is likely due to the generalised records to the north and south of the referral area (**Plan A10**).

Further, the impact area provides marginal foraging habitat due to the lack of preferred foraging species as well as lack of mature, more productive specimens. The potential for the action to impact Regent Honeyeater habitat is relatively small given the level of disturbance across the site and availability of intact vegetation within the wider locality. 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.

3. Fragment an existing population into two or more populations

Assessment: The species was not identified on-site during extensive field survey effort. As previously discussed, with records of the species exist approximately 4.68km to the south east of the site, these records have a spatial uncertainty of 2,000m. eBird frequency mapping for the species does include the referral area within frequency mapping, due to the records located surrounding the site (**Plan A10**). Given the lack of key foraging species and limited suitable habitat on-site, it is unlikely the site facilitates the occurrence of a population of the species. Due to the superior mobility capacity of the species and abundance of suitable habitat in the greater landscape (including the Flinders Karawatha Corridor) the action will not fragment an existing population into two or more. A significant impact as a result of the proposed action is not likely.

4. Adversely affect habitat critical to the survival of a species

Assessment: The species was not identified on-site during field survey events. In addition, limited potentially suitable habitat was identified on-site. This habitat is not recognised as being

critical to the survival of the species due to the lack of key vegetation requirements and the levels of historical modification across the proposed impact area. The historical modification has resulted in a lack of preferred foraging species, as well as the mature, more productive specimens the species is known to prefer. Refer to the above subsection for an analysis of the vegetation on-site against the critical habitat definition.

Given the superior mobility capacity of the species and abundance of suitable habitat in the greater landscape (Flinders Karawatha Corridor) the proposed action will not adversely affect habitat critical to the survival of the species. A significant impact as a result of the proposed action is not likely.

5. Disrupt the breeding cycle of a population

Assessment: The Regent Honeyeater typically breeds during spring and summer, from August to February. The National Recovery Plan for the Regent Honeyeater also identifies Key breeding areas and other breeding areas for the species. These breeding areas are not located in proximity to the referral area, with these breeding areas being located in New South Wales. Regent Honeyeater specimens were not observed on-site during extensive field survey effort across multiple years. Further, no evidence of breeding was observed on-site. A significant impact as a result of the proposed action is not likely.

6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

Assessment: As discussed in the above subsection, the potential foraging habitat for the species is limited. This is due to a lack of preferred foraging species as well as large, mature specimens.

Given the superior mobility capacity of the species and abundance of preferential habitat in the greater landscape, 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. A significant impact as a result of the proposed action is not likely.

7. Result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat

Assessment: 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.

8. Introduce disease that may cause the species to decline, or

Assessment: The project is unlikely to introduce disease into the area, and therefore no significant impact is considered to result from the proposed action.

9. Interfere substantially with the recovery of the species.

Assessment: The recovery actions of the Regent Honeyeater are generally around understanding the species behaviours and characteristics and increasing community awareness. The proposed action is not considered to interfere with the recovery of the species because the habitat on-site is not considered significant. This is due to the limited extent of existing habitat on-site, and the level of disturbance in the form of cleared paddock area which are currently maintained. No significant impact is considered to result from the proposed action.

4.5 Additional policy guidelines, studies or consultation

Item 4.5 of the PD Response requests to ***“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.”***

Following the submission of the referral another 17.83 person hours were spent on-site in March, April and May (Autumn) 2022 conducting contemporary targeted surveys for MNES. These surveys included MHQA transects for the Koala and Grey-headed Flying-fox, SAT surveys and motion sensor camera deployment (refer to **Section 3.3.3** for further survey details relevant to each MNES).

The Guide to Greater Glider Habitat in Queensland (DES 2022) was published in 2022 following the uplisting of the Greater Glider to Endangered. The uplisting of the Greater Glider, and supporting Conservation Advice and aforementioned Guide to Greater Glider Habitat in Queensland provided new information on potential habitat for Greater Gliders. The Conservation Advice and Guide have been considered in the version of the PD.

No consultations with experts were undertaken following the referral. All other policies, guidelines and studies are consistent with information provided within the referral material (**Part B**).

4.6 Direct, indirect, consequential and cumulative impacts

Item 4.6 advises that the PD response must ***“Provide an assessment of the direct and indirect impacts that may occur during construction and post-construction phases, including:***

- a. The nature and extent of impacts (including direct, indirect* and facilitated impacts**), including timing and whether the impact is temporary or permanent. This must include the quality of the habitat impacted, a quantification of the total individuals/populations and habitat area in hectares and analysis of the indirect impacts such as fragmentation of the habitat in the proposed action area and surrounding areas. Consideration must be given to species habitat 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).***
- b. A local and regional scale analysis of likely impacts, with reference to the project’s potential contribution to cumulative impacts in the context of development patterns in the locality and region.***

- c. **An assessment of the likely duration of impacts to MNES as a result of the proposed action.**
- d. **An assessment of whether impacts are likely to be repeated, for example as part of maintenance.**
- e. **Discussion of the risk of potential impacts as a result of 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 preconstruction, clearing and earthwork phases.**
 - iii. **Increased presence of dogs – pre-construction, clearing and earthwork 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 earthwork phase of the project.**
 - v. **Disturbance from increased noise, artificial light, sediment generation and other relevant stressors during clearing and earthwork phases.**

***Note: Please review the following policy statement, providing guidance on what impacts constitute a ‘indirect consequence(s)’, under paragraph 527E(1)(b) of the EPBC Act.**

****Note: 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 domestic pools.”**

The direct, indirect and facilitated impacts have been summarised in **Table A23. Section 4.3.1** above described the direct impacts in detail. A detailed description of potential indirect impacts and an analysis of their potential impacts to Koala and Grey-headed Flying-fox are included in **Table A29**. Impacts to Greater Glider (*Petauroides volans*), Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera phrygia*) foraging habitat are not considered likely to occur as part of the proposed action and so they are therefore not included within **Table A29**.

Table A29: Direct, Indirect and Facilitated Impacts Summary

Construction Phase	Operation Phase (ongoing disturbance)
- Vegetation clearing - Habitat removal - Intensification of effects of fragmentation effects (i.e. edge effect, habitat degradation, barrier effects) - Weed dispersal and establishment	- Weed incursion - Vehicle strike - Increased predation by domestic animals - Noise and light pollution - Increased human presence

Construction Phase	Operation Phase (ongoing disturbance)
• Vehicle movements • Earthworks • Light emissions during construction • Noise and vibration • Waste disposal • Hazardous and dangerous goods • Increased human presence	

Facilitated impacts directly related to the development site are discussed in detail in **Table A30**.

It is noteworthy that the school will function as a regional education centre for the burgeoning community of the Ripley Valley. The project site is located within the RVPDA 'Urban Living' zone that is part of the Ipswich City Council Local Government Area. The 'Urban Living' zone is intended to provide urban and suburban neighbourhoods incorporating a mix of residential development including houses, multiple residential and other residential and live work opportunities. In addition, the 'Urban Living' zone must accommodate a wide range of other non-residential uses including neighbourhood centres, local employment areas, open space, community facilities and schools to service the growing Ripley Valley community. The school will contribute to the broader development intent and cumulative impact of the RVPDA.

Notably, a strategic referral by the State for the RVPDA was not pursued which has resulted in individual referrals and approvals under the EPBC Act for individual projects as depicted in **Plan A2**, and this referral will likewise ensure any impacts associated with the school proposal are appropriately addressed.

Table A30: Indirect Impact Analysis

Impact	Koala	Grey-headed Flying-fox
Indirect Impacts		
a. Reduction in habitat connectivity to surrounding habitats, and any potential edge effects or disturbance to surrounding habitats, including any adjacent conservation areas.	<u>Connectivity</u> Biodiversity connectivity is considered, in its current and future form, limited due to the referral area being bound by Ripley Road Residential Development (EPBC 2017/8095) located within the remainder of Lot 901 SP317868 and Ripley View Residential Subdivision (EPBC 2020/8615) also approved. Although properties the surrounding the site currently remain vegetated, they are earmarked for future development being located within the RVPDA. The rural residential properties to the east are located outside of RVPDA however, have been subject to historical clearing to support the land uses. The PDA Planning Scheme Zone Map indicates that the referral area and land surrounding the referral area is earmarked as 'Urban Living'. The referral area does not contain any areas zoned for Environmental Protection under the Development Scheme. A mapped Significant Riparian Corridor is located to the west of the referral area. In its current form, surrounding threats (i.e. encroaching urban development) create physical barriers for safe Koala movement and have increased fragmentation within the wider landscape reducing connectivity values across the referral area. Although the referral area is currently connected to vegetated properties to the with roads and road reserves bounding the site to the north and east, two existing EPBC referrals are located adjoining the site, where one had been approved and the area to the north is in the Further Information Request Stage, earmarking the properties for future development being located within the RVPDA. Existing and future development within the RVPDA will reduce safe movement	<u>Connectivity</u> No GHFF camps are located within or adjoining the referral area, with the closest known active camp located approximately 3.28 km to the north west located at Yamanto. The proposed action is not expected to reduce connectivity of suitable foraging habitat for the GHFF due to the highly mobile nature of the species and abundance of suitable habitat in the surrounding landscape. <u>Edge Effects and Disturbance</u> The ecological survey across the referral area ground-truthed the on-site vegetation as being historically modified with weeds present in areas. Although the referral area is dominated by remnant vegetation, no significant or unique ecological values were identified on the referral area. The proposed development will increase edge effects and disturbances, however, to an already degraded area of the vegetation within the referral area and in a landscape that is shifting to residential developments, the edge effects are not likely to be exacerbated.

Impact	Koala	Grey-headed Flying-fox
	opportunities for the Koala onto and within the referral area, with vegetation proposed to be retained within Open Space Corridors and Areas of Environmental Protection in the greater landscape. Desirable habitat within the broader landscape is considered associated with the Flinders-Karawatha Bioregional Corridor located approximately 8.2 km to the south east of the referral area. Two factors have contributed to the reduced connectivity of the referral area to the broader surrounding landscape. First, encroaching urban development including roads and the location of the Cunningham Highway and Centenary Highway as well as the Swanbank Power Station and neighbouring industrial area restricting safe Koala movement. Second, significant levels of clearing (past and present) in the surrounding landscape has resulted in a loss of suitable habitat in areas the Koala may be able to access safely. As such, the vegetation on the referral area and wider landscape is considered fragmented. <u>Edge Effects and Disturbance</u> The ecological survey on the proposed development site ground-truthed the referral area as being degraded due to historical land uses and clearing. As such, no significant or unique ecological values were identified on the referral area. The referral area predominantly remnant vegetation with a ground-layer containing a mix on introduced and native species. The proposed development will increase edge effects and disturbances, however to an already degraded area of the vegetation within the referral area, with proposed adjoining developments and rural residential properties.	
b. Disturbance from increased noise, artificial light, dust, sediment generation and other	This species was identified indirectly (i.e. scats) utilising the site. <u>Noise</u>	This species was not observed on-site during extensive surveys. The referral area is considered to comprise of vegetation which

Impact	Koala	Grey-headed Flying-fox
relevant stressors during construction and operation of the residential development.	Noise levels greater than existing ambient noise levels are expected during construction and operation within the referral area. Construction 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. Noise sources during operation are likely to comprise of vehicles, household utilities and potential voice and amplified music. Both steady continuous and single noise events have the potential to lead to ecological impacts. Noise is expected to elicit some avoidance response from fauna including the Koala, should any be using the surrounding vegetation. 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 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. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g. 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.	provides potential foraging habitat for this species, including important winter flowering species. <u>Noise</u> Noise levels greater than existing ambient noise levels are expected during construction within the referral area. 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 Grey-headed Flying-fox, should any be using the surrounding vegetation. Road noise will be the primary source of noise impact. The establishment and use of paths through landscaped areas will also provide a source of noise due to pedestrian traffic. However, as the Grey-headed Flying-fox is a highly mobile species and the closest known active Grey-headed Flying-fox camp is approximately 3.28 km away, the impact of this to any Grey-Headed Flying-fox 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. 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

Impact	Koala	Grey-headed Flying-fox
	Presence and intensity of artificial light in the referral area will temporarily increase during the construction phase; however, night works will not be permitted. Lighting will be directed to construction areas within the referral area. 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. With the implementation of standard mitigation measures, 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. Additionally, light pollution during operation will also be mitigated through design and compliance with general standards in guidelines, particularly for light required within open space areas for safety. Lighting within open space areas is to face towards the urban development and away from conservation areas and vegetation within neighbouring allotments. <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; • 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	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 referral area will temporarily increase during the construction phase; however, night works will not be permitted. Lighting will be directed to construction areas within the referral area. 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. With the implementation of standard mitigation measures, the project is likely to result in a negligible impact to any Grey-headed Flying-fox in the surrounding area due to the use of light pollution during construction. Additionally, light pollution during operation will also be mitigated through design and compliance with general standards in guidelines, particularly for light required within open space areas for safety. Lighting within open space areas is to face towards the urban development and away from conservation areas and vegetation within neighbouring allotments. <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; • dust lift-off from exposed surfaces (e.g. construction roads and pads);

Impact	Koala	Grey-headed Flying-fox
	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 the implementation of standard mitigation measures, the project is likely to result in a temporary and minor impact to any Koalas utilising the local area due to the generation of dust.	• 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. However, as the Grey-headed Flying-fox is a highly mobile species and the closest known active Grey-headed Flying-fox camp is approximately 3.28 km away, the impact of this to any Grey-headed Flying-fox in the surrounding area is considered to be minor.
Facilitated impacts		
c. Increased vehicle strike from increased frequency of vehicle movements throughout construction and operation of the school.	Upon completion of the proposed action, vehicle traffic will increase compared to baseline conditions, increasing the likelihood of vehicle strike of Koalas should any occur in the area. However, the probability of fauna strike is reduced due to the fact that most fauna will generally avoid urban areas and given the surrounding rural residential properties and earmarked land parcels for residential developments. Additionally, the proposed action and surrounding development will be developed in accordance with the Development Scheme, which identifies suitable Open Space Corridors and Environmental Protection to facilitate safe movement and refuge throughout the wider landscape.	Presence of roads and vehicle traffic will increase compared to baseline conditions, increasing the likelihood of vehicle strike for GHFF which may continue to forage on retained vegetation within the greater landscape. However, the action is for the construction of a school, where outside of school hours the traffic is not considered to be increased. It is unlikely that Grey-headed Flying-fox will be impacted by an increase in vehicle strike potential during the operation of the school. Additionally, Grey-headed Flying-fox are not ground-dwelling species and no roosts were identified within the referral area, further reducing the risk of vehicle strike for Grey-headed Flying-fox.

Impact	Koala	Grey-headed Flying-fox
	No open space areas are proposed with the referral area due to the small area and required vegetation clearing to facilitate the construction of education facilities. Additionally, neighbouring the referral area will neighbour a retain linear open space and ecological corridor zone from the Ripley Road Residential Development (EPBC 2017/8095). While the action will increase the vehicle traffic in the greater landscape, the proposed impacts will be mitigated as the action is education facilities. This will likely result in an increase in vehicles during school drop off/pick up hours, where reduced speed limits are in place. It is considered unlikely that the action will result in an increase in vehicle strikes to Koalas.	
d. Introduction to and /or proliferation of weeds and pathogens, in habitat for threatened species.	The proposed action is not considered likely to increase the prevalence of weeds on the referral area given the dominance of weeds and exotic species across the referral area. Further, most of SEQ's Koala populations already have a high prevalence of Chlamydia infection and Koala Retrovirus (KoRV), and sick Koalas have been recorded in the vicinity of the referral area. The proposed action is not considered likely to introduce pathogens that would negatively impact any Koalas that should be utilising this area.	The proposed action is not considered likely to increase the prevalence of weeds on the referral area given the dominance of weeds and exotic species across the referral area. Further, the proposed action is not considered likely to introduce pathogens that would negatively impact any Grey-headed Flying-fox that should be utilising this area.
e. Increased presence of dogs.	The proposed action is not considered to result in an increased presence of dogs. The subject site is considered vacant, with the potential for feral dogs or roaming domestic dogs to utilise the subject site. During construction, Site Based Management Plans will be implemented, where dogs are not permitted on-site during civil works and construction.	The proposed action is not considered to result in an increased presence of dogs. The subject site is considered vacant, with the potential for feral dogs or roaming domestic dogs to utilise the subject site. During construction, Site Based Management Plans will be implemented, where dogs are not permitted on-site during civil works and construction.

Impact	Koala	Grey-headed Flying-fox
	Post construction, the development is not considered to result in an increase in dogs as the purpose is for education facilities, not a residential development.	Post construction, the development is not considered to result in an increase in dogs as the purpose is for education facilities, not a residential development.
f. The increased risk of entanglement in wire fencing or other infrastructure within, and adjacent to, the referral area.	Industry standard fauna friendly site design measures will be implemented across the proposed action to reduce any physical risk posed by an increase in infrastructure in this area.	Industry standard fauna friendly site design measures will be implemented across the proposed action to reduce any physical risk posed by an increase in infrastructure in this area.
g. Changes to hydrology and water quality within, and around, the referral area, including increased siltation.	No waterways are located within the referral area.	No waterways are located within the referral area.

5 Avoidance and Mitigation

This section responds to Item 5 of the PD request.

5.1 Description of impact avoidance mitigation measures

Item 5.1 of the PD Request asks for the proponent to ***“To clarify the proposed measures to avoid and mitigate impacts, the preliminary documentation must:***

- a. Provide a consolidated assessment of all proposed measures to avoid and mitigate impacts, including those provided in the referral and any additional to those described in the referral.***
- b. Detail how all reasonable efforts have been made to avoid impacts to MNES, and that any remaining impacts are mitigated to reduce the impacts on MNES. Discussion of consideration and assessment of alternative strategies, plans and measures to avoid and mitigate impacts.***
- c. Describe (including maps and imagery) the location, boundaries and size of buffer areas or proposed exclusion/retention areas, and details on how these areas will be enhanced, protected and maintained including a schedule of management actions and reporting. Also include a description of any fences or barriers which may be installed around areas where impacts will be avoided.***
- d. Provide details of ongoing monitoring and analysis to inform adaptive management of retained habitat areas.***
- e. Provide an assessment of the expected or predicted effectiveness of the avoidance and mitigation measures for each MNES species/community, including the scale and intensity of impacts of the proposed action and the onground benefits to be gained through each of these measures. Where an impact on a species/community is avoided this should be stated.***
- f. Provide details of any ongoing mitigation and management measures during the operation of the facility. This includes management of direct and indirect impacts for the Koala and other relevant MNES, due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by vehicles.***
- g. Describe the proposed mitigation measures to be taken in accordance with requirements of the Queensland State government and local governments.***
- h. Provide evidence of the effectiveness of each avoidance and mitigation measure discussed above, noting that the effectiveness of a particular measure is a reflection of the confidence in the ability of the measure to reduce the risk or threat. The assessment of the effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome.***
- i. Clearly list the outcomes of the avoidance and mitigation measures, and follow the specific, measurable, achievable, relevant and timely (SMART) principle.***

- j. Provide details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.”**

5.1.1 Consolidated Assessment of Proposed measures to Avoid and Mitigate impacts

Avoid

The development is located on Part of Lot 901 on SP317868, accounting for 19.1 ha of the larger 87.49 ha allotment. While the referral area is located within Category B (remnant) vegetation, the habitat within the referral area does not contain any special or unique values. The lot is not mapped as containing Significant Riparian Corridor nor is located within an Environmental Protection Zone under the Ripley Valley Development Scheme. The area is designated for school development under existing provisions and a level pad must be delivered to Education Queensland. The site selection for the school was undertaken by Economic Development Queensland and has been slated for this location in State endorsed planning provisions. There is no opportunity to avoid impacts in this location with Education Queensland requiring delivery of a cleared development pad.

Mitigate

The proposed action will be entirely located within the referral area, which is predicted to remove 19.1 ha of vegetation. A number of mitigation measures are proposed to reduce identified impacts on the Koala and Grey-headed Flying-fox and their habitat and include the following:

- Implementation of the Natural Environment Site Strategy (NESS);
- Preparation of Vegetation Clearing and Management Plans (VC&MP);
- Preparation of Fauna Management Plans (FMP);
- Preparation of Environmental Pre-clearance Prestart Packages;
- On-site prestart meeting;
- Engagement of a Queensland Department of Environment and Science (DES) registered fauna spotter catcher;
- Implementation of fauna friendly road design and signage where necessary; and
- Ongoing annual compliance reporting.

5.1.2 Impacts on Matters of National Environmental Significance

Item 5.1b of the PD requests asks to ***“Detail how all reasonable efforts have been made to avoid impacts to MNES, and that any remaining impacts are mitigated to reduce the impacts on MNES. Discussion of consideration and assessment of alternative strategies, plans and measures to avoid and mitigate impacts.”***

The site is mapped as Category B (remnant) vegetation that is considered habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox. The vegetation on-site is located within the RVPDA, where the land is earmarked to support the SEQ growing population. As the referral site is located within the RVPDA, the location of the action is more suitable than neighbouring vegetated areas

outside of the RVPDA. The implementation of the above listed management plans will mitigate potential impacts on MNES.

The action requires the removal of all vegetation within the 19.1 ha impact site. No avoidance is proposed for the development. The site selection for the school was undertaken by Economic Development Queensland and has been slated for this location in State endorsed planning provisions. There is no opportunity to avoid impacts in this location with Education Queensland requiring delivery of a cleared development pad. The mitigation measures are considered effective in minimising direct and indirect impacts to potential habitat for MNES external the referral area. The proposed action is considered to result in a residual significant impact via the removal of 19.1 ha of potential Koala habitat and Grey-headed Flying-fox foraging habitat (refer **Section 4.4**).

5.1.3 Location, boundaries and buffers

Item 5.1c of the PD request asks to ***“Describe (including maps and imagery) the location, boundaries and size of buffer areas or proposed exclusion/retention areas, and details on how these areas will be enhanced, protected and maintained including a schedule of management actions and reporting. Also include a description of any fences or barriers which may be installed around areas where impacts will be avoided.”***

The action does not propose to retain vegetation within the referral area, requiring the clearing of the 19.1 ha of vegetation to facilitate the construction of a school in a landscape that is undergoing rapid urbanisation.

As discussed, fencing is proposed around the referral area due to the purpose being education facilities (**Plan A1**). Proposed fencing will be installed by and comply with the requirements of Education Queensland.

5.1.4 Retained Habitat

Item 5.1d of the PD request asks to ***“Provide details of ongoing monitoring and analysis to inform adaptive management of retained habitat areas.”***

The action does not propose to retain vegetation within the referral area.

5.1.5 Effectiveness of Avoidance and Mitigation Measures

Item 5.1e of the PD request asks to ***“Provide an assessment of the expected or predicted effectiveness of the avoidance and mitigation measures for each MNES species/community, including the scale and intensity of impacts of the proposed action and the on ground benefits to be gained through each of these measures. Where an impact on a species/community is avoided, this should be stated.”***

The action requires the clearing of vegetation across the 19.1 ha impact site to facilitate the construction of a level development pad for a school. The school is identified under State infrastructure planning in this location, and designated as such under the State endorsed development scheme. It's location is derived from the calculated need to provide school services within the burgeoning Ripley Valley Priority Development Area community. Direct avoidance in this location is therefore not feasible, noting retention of the adjoining waterway corridor under the development scheme allows for the avoidance of localised habitat values.

Mitigation measures proposed to minimise potential impacts to potentially occurring MNES, particularly the Koala and Grey-headed Flying-fox, during vegetation clearing, construction and operation of the action, outlined in the preceding sub-sections, are evaluated in **Table A31**.

Although no strict avoidance measures have been proposed, the mitigation measures are considered effective in minimising direct and indirect impacts to potential habitat for MNES external the referral area. The proposed action is considered to result in a residual significant impact via the removal of 19.1 ha of potential Koala habitat and Grey-headed Flying-fox foraging habitat (refer **Section 4.4**). No other works as part of the action are considered to result in a significant residual impact to MNES.

Table A31: Mitigation effectiveness assessment

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
Construction Phase								
Vegetation Clearing	Controlled removal of remnant vegetation that provides potential habitat for threatened fauna species including Koala and Grey-headed Flying-fox	Moderate. The referral area does not contain any unique features which are of significant habitat value. The vegetation is considered to provide habitat for the Koala as well as potential foraging habitat for GHFF. While no Koalas were observed on-site, scats have been observed across the subject site. This activity is not considered a significant impact to MNES.	All clearing will be undertaken in accordance with mitigation measures outlined in Section 5.2, including: - Preparation of VC&MP; - Preparation of FMP; - Preparation of Environmental Pre-clearance Prestart Packages; - On-site prestart meeting; and - Engagement of a DESI registered fauna spotter catcher.	The proposed action will result in the unavoidable loss of remnant vegetation that has been subject to historical modification. Despite the relatively limited environmental values identified within the referral area, the mitigation measures ensure that direct construction impacts are minimised.	Low. Significant impact considered highly unlikely from the removal of this vegetation and clearing processes.	All vegetation clearing is limited to the areas approved under the EPBC Act and Planning Act 2016.	Yes. Removal of 19.1 ha of potential Koala and Grey-headed Flying-fox habitat.	Proponent / Site Contractor
	Risk of injury or mortality to threatened fauna species	Low. No direct observations of threatened fauna species were identified during the survey period. However, Koala scats have been observed within the impact area. 19.1 ha of critical habitat for Koala and foraging habitat for the Grey-headed Flying-fox is located within the impact area.	All clearing will be undertaken in accordance with mitigation measures outlined in Section 5.2. This will include: - Provisions for the proponent to engage a qualified Fauna Spotter Catcher to participate in all stages of vegetation clearing. The Fauna Spotter Catcher will be required to adopt elements of the Draft Code of Practice (refer Section 5.2.5). The role of the Fauna Spotter Catcher is to minimise risk that injury or deaths occur to fauna species. - Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are flushed into safe 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. - Restricted construction hours (<i>i.e.</i>, 6am -6pm) - Prohibition of companion /security animals (e.g. dogs). - Restricted vehicle speeds (max 40km) within pre-construction and	The use of a Fauna Spotter Catcher throughout clearing is an effective tool to: - Identify the types of species within the referral area prior to clearing; and - Identify and flag habitat features that require thorough examination before clearing. Fauna Spotter Catchers have a primary role to ensure no fauna are in/near vegetation before it is cleared. All efforts have been made to minimise risk that fauna will be injured or be killed during vegetation clearing, particularly given the onerous and thorough procedures set out the VC&MP, FMP, and The Draft Code. The sequential clearing of vegetation will allow for the gradual loss of vegetation, giving fauna time to naturally disperse. 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 or death.	Very Low. The implementation of the avoidance and mitigation measures reduce the risk of injury or mortality to threatened fauna species to very low.	The potential for Koala injuries or mortalities during clearing is minimised. The potential for Grey-headed Flying-fox injuries or mortalities during clearing is minimised.	No. Significant residual impact not expected as a result of the activity.	Proponent / Site Contractor

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
			construction areas to be implemented under the CMP.					
	Fragmentation of habitat critical for the survival of threatened fauna species	Moderate No direct observations of threatened fauna species were identified during the survey period. However, Koala scats have been identified on-site. The vegetation within the proposed impact area meets the EPBC definition of habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox.	Currently, the site contains remnant vegetation that has been subject to historical modification. The site is located within the RVPDA, where neighbouring the referral area exists one EPBC referral in the post approval phase and one in the further information request phase. The action proposes to remove all vegetation within the referral area. Vegetation clearing will be undertaken sequentially to allow fauna to disperse from construction areas, into safe habitat. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the FMPs and informed by the Fauna Spotter Cather reports. Clearing will be undertaken in a way that flushes fauna into the neighbouring linear open space corridor and ecological corridor area 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 referral area 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.	Habitat isolation and fragmentation is a primary concern due to its impacts on fauna. No threatened fauna species were observed within the subject site with only indirect evidence. The direction of clearing of vegetation in accordance with the VC&MP and FMPs will ensure that clearing does not create fragmented habitat islands that could trap fauna. Rather, procedures will be in place to ensure clearing flushes fauna away from construction areas into the neighbouring vegetation retention zone and/or surrounding habitat areas that are connected to the wider landscape.	Very low. The implementation of the avoidance and mitigation measures reduce the risk of habitat fragmentation from moderate to low.	All vegetation clearing is limited to the areas approved under the EPBC Act and Planning Act 2016.	No. Significant residual impact not expected as a result of the activity.	Proponent / Site Contractor

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
Vegetation clearing, earthworks and construction	Impacts from erosion and sedimentation.	Moderate. The referral area does not contain any mapped waterways or other hydrological features. However, there is a mapped waterway located in proximity to the referral area.	Works are to be undertaken in accordance with the mitigation measures and management plans outlined in Section 5.2. Specifically: - Sequential vegetation clearing and avoiding soil disturbance where all activities occur will be timed and staged to minimise the time and extent to which soil is exposed to water and wind - controlling water movement into and around the site where reasonable and practicable measures must be taken to ensure that all runoff upstream of the site is diverted around the site. - Water within the site will be diverted around areas where soil has been disturbed and stockpiles, and flow velocities will be minimised. - Best practice sediment capture controls and retaining soil and other pollutants on the site – these controls must be appropriate to the soil and weather conditions. - Stabilising all disturbed areas as quickly as possible.	Despite the relatively limited environmental values identified within the referral area, disturbance to soil is the primary threat to surface water quality during the construction phase. Sediment and erosion control measures are to be in accordance with <i>Ipswich Planning Scheme 2006 and Sediment Control and Best Practice Erosion and Sediment Control</i> (IECA, 2008). The mitigation measures are therefore considered effective in minimising and mitigating risk of disturbance from light and noise to threatened and migratory fauna species during construction, and allow for adaptive management and corrective actions where required.	Low. The implementation of mitigation measures reduce the risk of impacts from moderate to low.	Erosion and Sediment Control methods are implemented during earthworks.	No. Significant residual impact not expected.	Proponent / Site Contractor
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.	Moderate. No threatened or migratory fauna species were observed during field surveys for the proposed action, with only koala scats were observed throughout the referral area. The subject site is considered critical habitat for the Koala and potential foraging habitat for the GHFF. The action requires the removal of all vegetation within the impact area.	The action requires the removal of all vegetation within the referral area. The VC&MP and FMP will include controls to avoid, minimise and mitigate risk of disturbance to neighbouring vegetation during construction, including undertaking construction in off-peak seasons with restricted construction hours (6am-6pm) to be implemented under the CMP. Additionally, restricted construction hours will limit disruption from light and noise impacts, as well as allow a 12 hour period for fauna to disperse and forage.	The implementation of VC&MP and FMP, are considered effective in avoiding, minimising and mitigating risk of disturbance from light and noise to threatened and migratory fauna species during construction, and in vegetation neighbouring the development. This allows for adaptive management and corrective actions where required. Limiting hours of construction and clearing to daylight hours, allows a 12 hour period for safe dispersal.	Low. The implementation of the avoidance and mitigation measures reduce the risk of light and noise disturbance to threatened and migratory fauna species from moderate to low.	Implementation of the VC&MP and FMP.	No. Significant residual impact not expected	Proponent / Site Contractor
Contamination, weeds and pathogens	Construction activities increase the risk of weeds, pathogens and contamination into the referral area.	Moderate. Although, no threatened or migratory fauna species were observed within the	Due to the high levels of modification on-site, the site is already infested with weeds species.	Avoidance of direct impacts where possible will ensure potential habitat resilience is maintained lessening the likelihood and severity of impacts. Further mitigation measures to be	Low. These measures are considered effective in avoiding, minimising and	All vegetation clearing is limited to the areas approved under the EPBC Act and Planning Act 2016.	No. Significant residual impact not expected with the	Proponent / Site Contractor

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
		referral area, an increase or spread in weeds and pathogens can have significant impacts on threatened and migratory species and their habitat.	To manage potential impacts, weed and pathogen management procedures will be included within the VC&MP and FMP. Weeds will be actively managed within the construction footprint and disposed of appropriately. Additionally, no companion animals (e.g. dogs) will be allowed within construction areas and vehicle wash down procedures will be implemented during construction.	implemented as part of the VC&MP and FMP are best practice and in accordance with standard procedures and guidelines.	mitigating risks of contamination, weeds and pathogens to MNES values, reducing the risk from moderate to low.	The VC&MP, FMP, and Site Based Management Plan do not permit dogs on-site and nominate weed and pathogen management procedures. The Principal Contractor implements erosion and sediment controls as advised by the consulting Certified Professional in Erosion and Sediment Control.	implementation of mitigation measures.	
Vehicle disturbance	Threatened or migratory fauna species disturbance, Injury or mortality from vehicles.	Low. No threatened or migratory species were observed during field surveys, however, scats were observed throughout the referral area. While the action requires the removal all of vegetation within the referral area, Koala and Grey-headed Flying-fox remain potential occurrences as they are known to occur within the locality.	The implementation of the VC&MP and FMP will provide guidance on measures to reduce vehicle/fauna interactions. Reduced vehicle speeds will be implemented throughout the construction area to minimise vehicle disturbances. All construction personnel will complete site induction process prior to commencement of the action. As part of this training, all personnel will be instructed on their obligations in regard to vegetation clearing protocols and to protect native fauna. Additional controls for MNES values are to be included and presented in regular toolbox talks.	Reduced vehicle speeds, site inductions and regular toolbox talks are considered effective measures to reduce the risk of vehicle/fauna interactions.	Very Low. These measures are considered effective in avoiding, minimising and mitigating risks of vehicle disturbance to threatened and migratory fauna species, reducing the risk from low to very low.	The VC&MP and FMP will be approved site management plans. Site speed limits enforced.	No. Significant residual impact not expected with the implementation of mitigation measures	Proponent / Site Contractor
Barriers to dispersal	Isolation of threatened fauna species and/or fragmentation of populations.	Low. No threatened or migratory species were observed during field surveys. However, Koala scats have been observed on-site and Grey-headed Flying-fox remain potential occurrences as they are known to occur within the locality. Construction process can increase barriers to dispersal through stockpiling, erection of temporary or permanent fencing and construction of buildings	The VC&MP and FMP will provide advice and guidance clearing protocols and nominate appropriate locations for stockpiling materials. Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are guided towards 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 while clearing. Temporary fauna exclusion fencing will then be erected to prevent fauna dispersing into construction areas. Further, a Fauna Spotter Catcher will be onsite throughout the	The direction of clearing of vegetation in accordance with the VC&MP and FMP will ensure that clearing does not create barriers that could trap or isolate fauna. Rather, procedures will be in place to ensure clearing flushes fauna away from construction areas into the vegetation retention zone neighbouring the site.	Very Low-Nil. It is extremely unlikely that fauna will be trapped or isolated during vegetation clearing and construction, particularly given the onerous and thorough procedures set out the VC&MP and FMP.	Works are contained within the referral area and dispersal opportunities are maintained within the off-site corridor at all times during construction in accordance with the VC&MP and FMP.	No. Significant residual impact not expected with the implementation of mitigation measures.	Proponent / Site Contractor

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
			vegetation clearing process to ensure fauna disperse safely.					
Operation Phase								
Barriers to dispersal and habitat fragmentation	Isolation of threatened fauna species and/or fragmentation of populations.	Low.	The action proposes to removal all vegetation within the referral area.	The action of the school will result in barrier for dispersal of fauna into the referral area.	Low.	The waterway corridor located to the west of the referral area is maintained for dispersal opportunities.	No. Significant residual impact not expected with the implementation of mitigation measures.	Education Queensland
		No threatened fauna were observed during field surveys, while koala scats were observed.	Offsite, neighbouring the referral area there is a waterway corridor that will continue to facilitate connectivity for fauna.	However, the removal of vegetation on-site will not contribute to habitat fragmentation, as surrounding the site is earmarked for development.	The action does not encourage the movement of fauna, particularly MNES through the referral area and the action is for a school, to keep both students and MNES safe.			
		However, the referral area is considered critical habitat for the Koala as well as foraging habitat for the Grey-headed Flying-fox.	The action will not impact the connectivity retained offsite.					
Increase vehicle movements	Threatened or migratory fauna species disturbance, Injury or mortality from vehicles.	Low. No threatened or migratory species were observed during field surveys. However, Koala and Grey-headed Flying-fox remain potential occurrences as they are known to occur within the locality. The proposal, being a school, will have limited internal road. In combination with no retained vegetation the likelihood of vehicle strike to fauna is therefore low. However, the operation of the development will increase vehicle movements on the surrounding roads.	A number of measures will be imposed to avoid and mitigate the risk of fauna being hit by vehicles. Although the risk to vehicle strike is low, these measures will be concurrent for Koala and Grey-headed Flying-fox. These measures include: - Imposition of low vehicle speeds to reduce the risk of collisions. - Installation of traffic calming devices, fauna movement solutions and wildlife crossing awareness signage where applicable. - Install awareness signage in areas 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 native fauna, particularly threatened and migratory species from vehicle strike. Importantly, low vehicle speeds will be imposed along internal 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 threatened and migratory species have potential to occur in the area encouraging them to maintain a low vehicle speed. The purpose of these measures is to enable the objective of no injury or death to threatened and migratory species as a result of vehicle strike. These measures will also be effective for reducing risk of vehicle strike.	Very Low. Vehicle speeds will be signed and enforced as for public roads. Awareness signage to be installed where necessary throughout operation.	Road warning signage installed to request road users take due care as per ICC requirements. Road speeds as per ICC requirements in areas where wildlife may occur.	No. Significant residual impact not expected with the implementation of mitigation measures.	Education Queensland
Human presence	Fauna behavioural changes and/or avoidance of fauna species.	Moderate. No threatened or migratory species were observed within the subject site. However, vegetation on-site meet the definition of habitat critical to the survival of the Koala and foraging habitat for Grey-headed Flying-fox. The action will result in an increase in human presence on the subject site, compared to baseline conditions.	The proposed action is for the construction of a school, while there will be an increase in human presence, fauna will not be encouraged into the referral area and human presence will be limited.	Ensure staff and students stay within the school site and do not encourage movement into corridors in the greater landscape.	Low. These measures are considered effective in avoiding, minimising and mitigating risks of flight response and behavioural change for native fauna as a result of increased human presence, reducing the risk from moderate to low.	Implement community education campaign. Install appropriate signage to deter people from accessing corridor.	No. Significant residual impact not expected with the implementation of mitigation measures	Education Queensland

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
Predation by domestic animals	Injury or death from attack on threatened and migratory fauna species.	Moderate. No threatened or migratory species were observed within the subject site. However, the vegetation on-site is considered habitat critical to the survival of the Koala and foraging habitat for the Grey-headed Flying-fox. While there is potential for an increase in intensity of edge effects on retained areas external the referral area from an increase in domestic dogs compared to baseline conditions, this is considered unlikely.	The proposed action is for the construction of a school and domestic dogs will be an unlikely occurrence within the school, unless a required service dog.	As the proposed action is for a school, it is unlikely there will be domestic dog and native fauna interactions.	Low. Domestic dogs that may be within the school area are likely to be service dogs, with domestic dogs not encouraged/ permitted on school grounds.	Implement community education campaign. Install appropriate signage.	No. Significant residual impact not expected with the implementation of mitigation measures	Education Queensland
Noise and lighting disturbance	Fauna behavioural changes and/or avoidance	Moderate. No threatened or migratory species were observed within the referral area. However, vegetation on-site includes habitat critical to the survival of the Koala and potential Grey-headed Flying-fox foraging habitat.	There will be an increase in noise and lighting disturbance compared to baseline conditions. However, no vegetation is proposed to be retained within the referral area. The school can be designed based on environmental guidance to limit lighting disturbance to the waterway corridor located to the west of the referral area. Additionally, the school will have relatively consistent operating hours, limiting noise and light disturbances to predominantly daylight hours. Lighting to be installed in accordance with AS/NZS 1158 Set: 2010: Lighting for roads and public spaces and AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting Designs in accordance with the standards adequately minimise and mitigate impacts to the areas external the referral area while balancing the Crime prevention through environmental design (CPTED) principles. To reduce impacts of light the standard recommends lighting only the object or area intended by keeping lights close	The proposal can limit disturbances including noise and light to the Waterway Corridor located to the west of the referral area through design and hours of operation	Low. These measures are considered effective in avoiding, minimising and mitigating risks of avoidance response and behavioural change for native fauna as a result of increased light spillage and noise, reducing the risk from moderate to low.	Lighting installed in accordance with AS/NZS 1158 Set: 2010: Lighting for roads and public spaces and AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.	No. Significant residual impact not expected with the implementation of mitigation measures	Education Queensland

Activity/ Disturbance	Risk	Pre-mitigation Risk Assessment	Mitigation measure	Evaluation of the Effectiveness	Post-mitigation Risk Assessment	Performance Criteria	Significant Residual Impact (Yes/No)*	Responsible Party
			to the ground, directed and shielded to avoid light spill (refer AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting – Figure 1A).					

5.1.6 Ongoing Mitigation and Management Measures

Item 5.1f. of the PD request asks to ***“Provide details of any ongoing mitigation and management measures during the operation of the facility. This includes management of direct and indirect impacts for the Koala and other relevant MNES, due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by vehicles.”***

The proponent will be required to adhere to the approval conditions of the overarching MCU development approval (Application Number 34/2015/MAPDA/B) and any subsequent development applications (e.g. Reconfiguring a Lot (ROL) and/or Operational Works (OPW)). As such, the proponent will be required to prepare and undertake works in accordance with NESS (existing; refer **Attachment A8**), VC&MP, FMP, Stormwater Management Plans, Construction Management Plans and Erosion and Sediment Control Plans and overseen by EDQ.

The NESS identifies the whole allotment (Lot 901 SP 317868) ecological values and provides strategies to avoid, mitigate and restore or offset identified values. The NESS specifies overall outcomes, strategies / actions, design standards / resources, indicative timing and completion criteria for the following elements:

- Survey, identification and reporting
- Remnant vegetation containing endangered regional ecosystems
- Other vegetation
- Koala
- Threatened flora and fauna species
- Native fauna (not listed as threatened)
- Waterways
- Land degradation
- Rehabilitation and Restoration
- Weed and Pest Species
- Monitoring, management plans and reporting

Ongoing monitoring and management actions will be undertaken across the proposed offset area and detailed in the impending OMP.

5.1.7 State and Local Government requirements

Item 5.1g of the PD request asks to ***“Describe the proposed mitigation measures to be taken in accordance with requirements of the Queensland State government and local governments.”***

The Ripley Valley is located in the western growth corridor of SEQ. In 2009, Ripley Valley was identified under the SEQRP by the State Government because of its potential to absorb a vast portion of the regional area's

population over the two-decade timeframe. The broader Ripley region will see an expected 133,800 new residents by 2036, needing to be accommodated in more than 50,000 dwellings.

The referral site is located within the RVPDA 'Urban Living' zone that is part of the Ipswich City Council Local Government Area. The 'Urban Living' zone is intended to provide urban and suburban neighbourhoods incorporating a mix of residential development including houses, multiple residential and other residential and live work opportunities. In addition, the 'Urban Living' zone must accommodate a wide range of other non-residential uses including neighbourhood centres, local employment areas, open space, community facilities and schools to service the growing Ripley Valley community. The RVPDA Development Scheme is administered by ED and Ipswich City Council is the authority agency on behalf of EDQ.

The project has received a whole of site Material Change of Use for Residential and Recreation Uses, approval under the Economic Development Act 2012 (Application Number 34/2015/MAPDA/B, refer **Part B - Attachment 1**). Under that approval, the proponent is required to provide Infrastructure Master Plans and Overarching Site Strategies, including amongst many others the following environmentally specific site strategies:

- Natural Environment Overarching Site Strategy
- Ecological Sustainability and Innovation Overarching Site Strategy
- Total Water Cycle Management Overarching Site Strategy

Each overarching site strategy must:

- Be for the whole of the site
- Offer demonstration projects and other initiatives to respond to the requirements and standards, implementation strategies, stretch targets and goals outlined in the development scheme in force at the date of the approval and the guideline(s) in effect at the date of the approval.
- Identify opportunities for innovation.
- Include methodologies and undertakings for monitoring and reporting on the achievement of the overarching site strategy initiatives / outcomes, and
- Include any additional details or requirements set out in a relevant condition of this Approval.

Each overarching site strategy will be assessed against:

- The provisions of the development scheme in force at the date of the approval.
- The applicable guideline(s) in effect at the date of the approval, and
- Any further requirements set out in a condition of the approval.
- An endorsed overarching site strategy may be replaced by submitting for compliance assessment a new overarching site strategy for endorsement.

The overarching site strategies will introduce compliance assessment at operational works to ensure that the objectives of each site strategy are met. These will include flora, fauna, water and natural environment management controls that are designed to mitigate the potential for adverse impacts.

As discussed above, the project has received a whole of site Material Change of Use for Residential and Recreation Uses, approval under the *Economic Development Act 2012*, however each stage of the development is also assessed by Ipswich City Council as the authority agency on behalf of EDQ. The preparation of each ROL and OPW application for each stage consist of specialist consultant reports including the Significant Biodiversity Assessment Report, VC&MP (refer **Section 5.2.1**) and FMP (refer to **Section 5.2.2**). Significant Biodiversity Assessment Reports are prepared to address the *EDQ PDA Implementation Guideline No. 14 (Environmental values and sustainable resource use – IG14)* and identifies the site's ecological values and provides an assessment of the proposed development and potential impacts.

Economic Development Queensland (EDQ) assess the proposed development against the RVPDA Development Scheme and IG – 14 and provide conditions of approval specific to the site's ecological constraints and the proposed development. Typical conditions of approval include restrictions on hours of operation, development staging and sequencing (if applicable), fencing specifications, provision of a stormwater management plan, construction management plan and erosion and sediment control plan, fauna management and vegetation clearing protocols, including the engagement of a DESI endorsed fauna spotter catcher to supervise the removal of vegetation and direction of staged clearing. The applicant is required to provide EDQ the details of the engaged spotter catcher and a report detailing the following post completion of any stage of vegetation clearing:

- native fauna identified pre any post vegetation works including species taken from hollows;
- preventative and remedial actions put in place to ensure no harm to the species;
- confirmation of compliance with sequential clearing requirements of Koala habitat trees in accordance with the NCA;
- confirmation no vegetation clearing works occurred without supervision from the spotter catchers; and
- detail a log of all species taken to a vet, wildlife hospital or equivalent for treatment as a consequence of injury following clearing works.

As discussed directly above and in **Section 5.2.4**, A Fauna Spotter Catcher must be appointed to ensure fauna management prior to, during and post clearing in accordance with the NCA 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 be within the referral area during all times of construction. 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 (refer to **Section 5.2.4** for further details).

Additionally, the site is identified as a high-risk area within the flora survey trigger map administered under the NCA. The flora survey trigger map identifies high-risk areas where critically endangered, endangered, vulnerable or near threatened native plants are likely to be present. High-risk areas are required to be surveyed in accordance with the Flora Survey Guidelines – Protected Plants (DES, 2020). Following the completion of surveys either a Protected Plant Exemption or Protected Plant Clearing Permit is required by the applicant and granted by DES. A Protected Plant Exemption is valid for 3 years following the date of the survey and a Protected Plant Clearing Permit is granted for a maximum of 2 years from the date of issue.

The referral area, and larger allotment, was surveyed using the preferred timed meander survey technique as per the Flora Survey Guidelines – Protected Plants in June 2018 and July 2021 by a suitably qualified person. The surveys were carried out as follows:

1. The area was traversed by foot by Senior Ecologist.
2. The start and finish times of each meander were recorded.
3. The tracklog of the project Ecologists' transects were recorded using a handheld GPS unit accurate to < 1 m.
4. All unique plant species encountered during each meander within each habitat type were recorded.
5. The site and surrounds were photographed, and any relevant observations were recorded.

No specimens listed under the NCA (or EPBC Act) have been identified within the referral area. An exemption over the referral area was granted by DESI (reference: APP0081452). If the action has not been completed prior to this date, another survey in accordance with the guidelines, and based on the survey findings, either an application for a Protected Plant Exemption or Protected Plant Clearing Permit will be required.

5.1.8 Evidence of Effectiveness

Item 5.1h of the PD request asks to ***“Provide evidence of the effectiveness of each avoidance and mitigation measure discussed above, noting that the effectiveness of a particular measure is a reflection of the confidence in the ability of the measure to reduce the risk or threat. The assessment of the effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome.”***

Table A31 lists proposed mitigation measures to reduced potential impacts on MNES and discusses effectiveness.

5.1.9 Outcomes of avoidance and mitigation measures

Item 5.1i. of the PD request asks to ***“Clearly list the outcomes of the avoidance and mitigation measures, and follow the specific, measurable, achievable, relevant and timely (SMART) principle.”***

Table A25 lists the proposed mitigation measures and provides outcomes following the SMART principle.

The action requires the clearing of vegetation across the 19.1 ha impact site to facilitate the construction of a school in a location designated under the Development Scheme in force. As such, no direct avoidance measures are proposed. Although no avoidance measures have been proposed, the mitigation measures are considered effective in minimising direct and indirect impacts to potential habitat for MNES external the referral area. The proposed action is considered to result in a residual significant impact via the removal of 19.1 ha of potential Koala habitat and Grey-headed Flying-fox foraging habitat (refer **Section 4.4**). No other works as part of the action are considered to result in a significant residual impact to MNES.

5.1.10 Pre-clearance and clearance procedures

Item 5.1j of the PD requests asks to ***“Provide details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.”***

Pre-clearance, clearing and post clearance measures have been discussed in preceding sub-sections. These measures have been summarised in **Table A32**.

Table A32: Pre-clearance to post clearance mitigation measures

Phase	Measure
Pre-clearance	• Site survey (including tree plot) for preparation of VC&MP and FMP. • Preparation of management plans including: – VC&MP (refer Section 5.2.1) – FMP (refer Section 5.2.2) – Stormwater Management Plan – Erosion and Sediment Control Plan – Construction Management Plan • Delineation of clearing areas with tree protection fencing. • Fence check completed by the environmental coordinator. • Engagement of DESI registered Fauna Spotter Catcher. • Completion of pre-clearance survey of the action area by the DESI registered Fauna Spotter Catcher and preparation of WPMP and WHIMP (refer Section 5.2.5 for details). • Preparation and distribution of Environmental Pre-start Checklist and Pre-start Package (refer Section 5.2.3 for details). • Pre-start meeting with all relevant stakeholders including the proponent, site supervisor, site contractor, administering authority, fauna spotter catcher and arborist.

Phase	Measure
Clearing	Supervision of all vegetation removal by DESI registered fauna spotter catcher (refer Section 5.2.4 for specific actions should fauna be encountered).
	Implementation of sequential clearing requirements in accordance with NCA.
	Vegetation clearing conducted in a staged manner to direct fauna towards areas of vegetation external the referral area.
Post clearance	Preparation of post-clearing fauna spotter catcher report.
	EPBC Annual Compliance Reporting (refer Section 5.2.6).
	EPBC Independent Audits (refer Section 5.2.7).

Of note, the broader site maintains a State endorsed Stormwater Infrastructure Master Plan that guides best practice stormwater management during site development. PDA Guideline 13 Engineering Standards sets out design standards for infrastructure in the PDA, with stormwater quality and quantity management infrastructure assessed against the following policies and guidelines:

- Queensland Environmental Protection (Water) Policy 2009
- Queensland State Planning Policy 2016 - water quality
- Water by Design: Concept Guidelines for WSUD 2009
- Water by Design: WSUD Technical Design Guidelines in SEQ 2006
- Water by Design: Bioretention Technical Design Guidelines 2012
- Water by Design: Music Modelling Guidelines 2011
- Water by Design: Framework for the Integration of Flooding and Stormwater Management into Open Space
- Queensland Urban Drainage Manual 2013
- Australian Rainfall and Runoff (ARR) 2016
- Australian Rainfall and Runoff (ARR): Project 11 Blockage of Hydraulic Structures (IEAust 2013)

Likewise, the relevant PDA guideline sets out the standards for erosion and sediment control, with management plans assessed against the following to ensure best practice implementation:

- International Erosion Control Association (IECA): Best Practice Erosion and Sediment Control 2008
- LGAQ: Introductory Erosion and Sediment Control Guidelines for Queensland Councils 2006

The Construction Management Plan (CMP) is intended to provide feasible, robust and appropriate management strategies to meet the requirements of relevant PDA and ICC guidelines for construction, IECA

Best Practice Erosion and Sediment Control and other relevant legislative documentation. The CMP will need to:

- Outline the Environmental Management System (EMS)
- Outline the applicable CMP structure
- Outline a review and preparation process
- Include the applicable environmental, legislative, approval and regulatory requirements
- Outline policy to comply with all requirements and improve effectiveness
- Prescribe strategic objectives and targets
- Outline organisational structure, responsibilities, authority and communication lines
- Set out the applicable scope of works
- Outline development, implementation and monitoring of environmental related processes
- Include a risk assessment process
- Outline contractor management and CMP compliance
- Outline training, awareness and induction processes for personnel
- Set out tools to monitor and manage CMP effectiveness
- Include internal and external auditing processes
- Outline incident and emergency processes
- Outline and describe CMP reporting requirements

The Stormwater Management Plan, Erosion and Sediment Control Plan and Construction Management Plan will be assessed and approved against relevant criteria by Ipswich City Council as the delegate to Economic Development Queensland at operational works and detailed design which is not yet available for this project. The Proponent will be responsible for the approval and implementation of these plans.

5.2 Key Mitigation Measures

Item 5.2 of the PD Request advises that the response must ***“For each measure proposed; indicate the:***

- a. Impacts to be avoided and/or mitigated***
- b. Responsible party***
- c. Environmental outcomes to be achieved***
- d. Milestones / performance / completion criteria***
- e. An evidence-based likelihood of success/ risk assessment***
- f. Proposed monitoring and evaluation program***
- g. Contingency measures”***

Refer to **Table A31** and the following subsections for the requested further details.

5.2.1 Vegetation Clearing and Management Plan

The Vegetation Clearing and Management Plan (VC&MP), will provide an overview of core retention and removal areas within the application site. Additional VC&MPs will be prepared specific to development stages so that clearing mechanisms and management procedures are precise and will include the following details:

- Clearly show all trees to be removed and retained
- Include details of all civil works likely to impact on existing vegetation
- Temporary and permanent exclusion and protection fencing for riparian corridors and parklands
- Roles and responsibilities for site contractors, developer and the consultant group
- Stockpiling and site access locations
- A clearing sequencing plan showing the commencement of clearing and direction of removal (this will be in conjunction with the Fauna Management Plan to allow for the appropriate flushing of fauna towards surrounding safe haven areas.
- Links to weed management and revegetation proposals
- The stock piling and reuse of cleared vegetation
- Specific details on the removal of previously identified potential fauna habitat trees
- Where trees are shown to be retained occur within disturbance zones they will be accompanied by necessary arborist specifications incorporated into the VC&MP.
- The VC&MP will designate trees to be protected for the on-going life of the proposal including both immediate remedial works (Crown thinning, coppicing) and long term monitoring for the potential of future works.

Refer **Attachment A3** for Preliminary VCFMP.

5.2.2 Fauna Management Plan and Protocols

Under Queensland's *Nature Conservation Act 1992*, all native fauna are protected and as such the following activities are required to ensure that vegetation removal and construction does not adversely affect native fauna species:

- Immediately prior to the commencement of clearing of native vegetation, a daily visual inspection of the area must be carried out;
- In the event of an animal being located, an area of 5 metres radius will be established around the tree, excluding machinery from this area until the animal has relocated (usually overnight); or
- If an animal requires relocating, this must be undertaken by a suitable qualified fauna expert (e.g. fauna spotter-catcher) recognised by the Queensland Parks and Wildlife Service.
- Any native fauna orphaned or injured by the development process must be reported to the Queensland Parks and Wildlife Service.

- The site supervisor is responsible for the safe management of site fauna and implementation of these specific fauna requirements.

Refer **Attachment A3** for Preliminary VCFMP.

5.2.3 Environmental Pre-Clearance Package

Each clearing phase will be subject to issue of an Environmental Pre-Clearance Checklist and Environmental Pre-Clearance Package to ensure all approval requirements are met prior to vegetation clearing. Environmental Pre-Clearance Checklists are designed to easily show compliance for approval requirements, including EPBC approval requirements, in a format where they can be 'ticked off' prior to vegetation clearing. The purpose of the checklist is to ensure:

- 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,
 - Any threatened fauna and / or fauna habitat is identified and appropriately managed, and
- Appropriate induction procedures are in place and environmental requirements are understood and complied with by all contractors and sub-contractors.

Environmental Pre-clearance Packages require all approval documentation, including EPBC approval requirements, relevant to that clearing stage to be prepared, compiled and distributed to all relevant parties prior to the commencement of clearing. The Environmental Coordinator will be responsible for preparation of and the Environmental Pre-clearance Package.

All relevant parties (e.g. civil contractor, clearing contractor, fauna spotter, 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.

5.2.4 Fauna Spotter Catcher Roles and Reporting

A DESI registered Fauna Spotter Catcher must be appointed to ensure fauna management, specifically Koala and Grey-headed Flying-fox management, 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 be within the referral area during all times of construction.

Under the NCA, 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:

- Undertaking wildlife load reduction measures through the pre-clearing trapping and relocation of wildlife within 1-2 weeks prior to the approved clearing being conducted. Sequential clearing cannot be used as a primary fauna management measure;
- Clearly mark (flag) vegetation found to contain fauna or fauna habitat (such as 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 within the referral area in accordance with the Nature Conservation (Koala) Conservation Plan 2017;
- Manage fauna habitat identified during the referral area inspection;
- 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. 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) and
- A combination of the above methods.

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

The project will adopt aspects of 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. This 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.

Aspects of 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 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, as much as possible, the ecological values of the development site and their surrounding natural environment (Draft Code, p.5)

The following components of the 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 DES.

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

The WPMP will include the following information:

- Description of the project with reference to impacts on wildlife or wildlife habitat;
- Pre-development plan of the referral area 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 of the WPMP the Fauna Spotter Catcher will prepare a more specific Wildlife and Habitat Impact Mitigation Plan (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 within the referral area during all phases of construction which involve potential impacts on wildlife or habitat. This will enable 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 will form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report will consist of the following 3 sections:

- a) 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 will also include recommendations and outline the type, frequency and timeframes for monitoring
- b) Wildlife Capture and Disposal Plan – Will 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

- c) Animal Injury and Euthanasia Report – similar details for the Wildlife Capture and Disposal Plan will be included in this report.

5.2.6 EPBC Annual Compliance Reporting

The proponent is required to complete an Annual Compliance Report (ACR) for the life of the approval. The ACR ensures the proposed action is undertaken in accordance with the EPBC approval and is published on the project's 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. The approval conditions will typically ensure regular independent audits of the proposed action are undertaken at the expense of the proponent.

5.3 Compliance with Policies and Guidelines

Item 5.3 of the PD Request asks must ***“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.*”**

Please provide a discussion on how the proposed action is consistent with the relevant species’ objectives or alternately, how the proposed avoidance, mitigation measures and offsetting will compensate for any residual significant impact, thereby ensuring consistency with the objective for relevant EPBC Act species.”

Threat abatement and recovery with regard to the proposed action are discussed in the context of relevant management plans, in the following sub-sections.

5.3.1 Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory) (Approved February 2022)

The EPBC referral was properly made while the Koala was listed as Vulnerable under the EPBC Act. The latest Conservation Advice came into effect on 12 February 2022. It lists six conservation and recovery actions that are categorised into ‘supporting strategies’ which provide for governance to coordinate actions, led by the Australian Government in partnership with the States and Territories, and ‘on-ground (direct) strategies’ which relate to improving habitat quality and restoration, implemented at the site level.

The development is considered to be consistent with the on-ground strategies detailed in the Conservation Advice and recovery Plan:

- Strategy 5: Strategic habitat restoration
- Strategy 6: Active metapopulation management

Strategy 5: Strategic habitat restoration

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

While the development proposes to impact 19.1 ha of habitat identified as critical for the survival of the Koala, the habitat on-site is relatively low quality with an overall habitat quality score of 7 out of 10. The surrounding lands have been excluded from the development footprint for the purpose of creating corridors and to protect and buffer site waterways as set out in the development scheme.

Of note, the proposal includes a significant offset to compensate for the loss of 19.1 ha of habitat critical to the survival of the Koala totalling 100.8 ha. The management objectives for the offset area include:

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

The proposed offset will provide for strategic habitat restoration for the Koala.

Strategy 6: Active metapopulation management

Metapopulation management concerns the movement of individuals and genes between populations. Consideration of metapopulation management is reflected in the development scheme by the provision of conservation areas and corridors.

Notably the proposed offset will provide optimal habitat value for the Koala in a location designated as a State level ecological corridor ensuring improved and ongoing habitat and connectivity value for the species. The enhancement of State corridors will augment opportunities for movement and gene transfer between Koala populations. Although the proposed action will involve the removal of habitat critical to the survival of the Koala, all significant residual impacts are to be compensated through the provision of land-based offsets. Proposed offsets will be located in Koala occupied areas of connected and resilient habitat.

5.3.2 National Recovery Plan for the Koala

The National Recovery Plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) was published in March 2022.

The recovery plan is informed by the 2021 EPBC Act listing assessment and Conservation Advice, new research, state and territory Koala plans and strategies, and consultation with partners, interest groups and individuals and focuses on the ten years to 2032. The recovery plan is a nationally led, landscape-scale conservation framework that provides a national approach to listed Koala conservation, coordinate fragmented actions across many national policies, disciplines and multiple jurisdictions, and prioritise investment to maximise the potential for recovery.

The overall goal of the National Recovery Plan is 'to stop the trend of decline in population size of the listed Koala, by having resilient, connected, and genetically healthy metapopulations across its range, and to increase the extent, quality and connectivity of habitat occupied.

The objectives of the National Recovery Plan are that by 2032:

Key Objective	Response
1A The area of occupancy and estimated size of populations that are declining, suspected to be declining, and predicted to decline are instead stabilised then increased.	The referral area comprises predominately of remnant vegetation that has been subject to historical modification. Historical land uses including broadscale clearing and logging have degraded remnant vegetation containing limited ecological value. Although no Koalas were identified during survey efforts, evidence of use, scats, have been identified within the referral area. The proposed action will reduce the area of occupancy within this locality through the loss (physical) of approximately 19.1 ha of habitat critical to the survival of the Koala. However, the subject site is located within the RVPDA, where the development scheme does not map the referral area as containing significant ecological value nor zoned as Environmental Protection. Although the proposed action will reduce the area of potential occupancy is not considered to reduce the size of the population. Avoidance measures have been sought throughout the design phase of the project to reduce direct impacts to MNES. Mitigation measures are to be implemented throughout the construction and operational phases of the proposed action to reduce the risk to individuals within and/or adjacent the referral area. Upon completion, the proposed action in combination with the proposed offset strategy will increase the area of occupancy for the Koala, within a well-connected and resilient occupied habitat within the same region
1B The area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased.	Not applicable. The SEQ Koala population is considered to be declining (refer Objective 1A).
2 Metapopulation processes are maintained or improved	Four SAT surveys were completed across the referral area recorded one (1) location with 'low' activity level and three (3) locations with a 'nil' activity level (refer to Table A8). Low activity levels can be associated with low density populations, density is usually affected by

Key Objective	Response
	primary food tree availability (Phillip and Callaghan 2011; Phillips and Callaghan 2000; Phillips et al. 2000). As such, the referral area is not considered to support a metapopulation. The referral area is surrounded by land earmarked for urban development to the west, south and north, with rural residential properties to the east, reducing habitat and increasing barriers and threats. Due to the small referral area and lack of significant environmental values on-site and mapped within the Ripley Valley Development Scheme, the referral area is not proposed to retain vegetation. For the loss of vegetation to support the action, an offset will provide an area of suitable habitat for the Koala, as outlined in the OMP.
3 Partners, communities and individuals have a greater role and capability in Koala monitoring, conservation and management.	Mitigation measures aimed at heightening community awareness are proposed. Importantly, low vehicle speeds and slow points will be imposed along roads where necessary, minimising the risk of vehicle strikes which were identified in the literature review as accounting for a large proportion of injuries and deaths. In addition, awareness signage and traffic calming devices 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. Although the proposed action will involve the removal of habitat critical to the survival of the Koala, all significant residual impacts are to be compensated through the provision of land-based offsets. Proposed offsets will be located on land that will be improved by rehabilitation to increase availability of habitat for this species and connect with existing regional biodiversity corridors, increasing the resilience.

5.3.3 Koala Sensitive Design Guideline

The DESI “Koala Sensitive Design Guideline” provides advice and information for managers, land-use planners, infrastructure providers and development proponents to determine appropriate measures to help avoid and minimise the impact of development and land-use planning on Koala populations. Measures in the guideline are based on Koala sensitive design principles that help development:

- retain and protect Koala habitat values in their natural state to allow Koalas to feed, rest and move around
- achieve permeability for Koalas through the landscape to ensure the safe movement of Koalas within and across a site
- reduce threats to resident and transient Koalas.

The DESI “Koala Sensitive Design Guideline” will be incorporated into the VC&MP and FMPs.

5.3.4 National Recovery Plan for the Grey-headed Flying-fox

The purpose of the National Recovery Plan for the Grey-headed Flying-fox is to set out the management and research actions necessary to stop the decline of, and support the recovery of the Grey-headed Flying-fox over the next 10 years. The overall objectives of this Grey-headed Flying-fox recovery plan are:

- to improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed Flying-foxes through habitat identification, protection, restoration and monitoring, and
- to assist communities and Grey-headed Flying-foxes to coexist through better education, stakeholder engagement, research, policy and continued support to fruit growers.

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

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

Although no roosts were identified on-site, the referral area is located in proximity to a known Grey-headed Flying-fox, 3.28km away in Yamanto. Habitat critical to the survival of the species is considered important winter and spring flowering vegetation communities. Important winter and spring vegetation communities are those that contain *Eucalyptus tereticornis*, *E. albens*, *E. crebra*, *E. fibrosa*, *E. melliodora*, *E. paniculata*, *E. pilularis*, *E. robusta*, *E. seeana*, *E. sideroxylon*, *E. siderophloia*, *Banksia integrifolia*, *Castanospermum australe*, *Corymbia citriodora*, *C. eximia*, *C. maculata*, *Grevillea robusta*, *Melaleuca quinquenervia* or *Syncarpia glomulifera* (Eby and Law 2008; Eby 2016; Eby et al. 2019).

Of the species listed above, , *Corymbia citriodora*, *Eucalyptus crebra*, *Eucalyptus siderophloia*, *Eucalyptus tereticornis*, and *Melaleuca quinquenervia* were recorded within the referral area. The Grey-headed Flying-fox is a highly mobile species and the closest known active Grey-headed Flying-fox camp is approximately 3.28 km away.. As such, the proposed action will result in the unavoidable loss of 19.1 ha of potential foraging habitat for the Grey-headed Flying-fox . An offset for the loss of potential Grey-headed Flying-fox foraging habitat will be provided.

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

No roosts were identified within the comprehensive surveys of the referral area between 2014 and 2022 and the nearest known active roost site located approximately, 3.28 km west of the referral area. However, this species was not observed roosting within the referral area. Preferred roosting habitat for the Grey-headed Flying-fox is poorly understood, therefore it is difficult to preserve potential roosting habitat for the species.

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

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

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

Not applicable. There are no observed roosts on-site, with the nearest known roost site located approximately 3.28 km west of the referral area.

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

Not applicable.

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

Not Applicable. There are no observed roosts on-site, with the nearest known active roost site located approximately 3.28 km west of the referral area.

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

Not applicable.

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

Not applicable.

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

No roosts were identified on-site and the nearest known roost site located approximately 3.28 km west of the referral area. The vegetation on-site contains five (5) of nineteen (19) important winter and spring foraging species for the Grey-headed Flying-fox. As such, it is considered that the referral area vegetation provides potential foraging habitat for this species.

The proposed action will involve the removal of 19.1 ha of potential foraging habitat within the referral area. Electrocution on powerlines where they occur is a risk however considered unlikely as the proposed action is for the construction of a school. In addition, entanglement in netting and on barbed-wire is considered highly unlikely to be located on-site during construction and operation of the proposed action and can be managed through the implementation of mitigation measures and procedures outlined within future management documents including the VC&MP and FMP. As such, the proposed action is not considered likely to impact the recovery of this species.

5.4 Significant Residual Impact

The proponent notes the Departments advice that ***'Based on the referral information, the department considers that the proposed action is likely to have residual significant impact on 19.1 ha of Koala (Phascolarctos cinereus) and Grey-headed Flying-fox (Pteropus poliocephalus) habitat.'***

This section describes the predicted significant residual impact the proposed action will have on MNES. As discussed within previous sections, the referral area is considered to provide critical habitat for the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox. The referral area is not considered to provide significant habitat for the Swift Parrot, Regent Honeyeater, Greater Glider nor any other MNES. As such, the significant residual impact includes:

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

Koala MHQA score of 6.25 (rounded to 6.00). Quantum impact for the Koala is therefore listed as:

- **Koala: 11.46 hectares**

Grey-headed Flying-fox FHA score of 5.85 (rounded to a 6.00). Quantum impact for the Grey-headed Flying-fox is therefore listed as:

- **Grey-headed Flying-fox: 11.46 hectares**

The proposed action is not considered to result in a significant residual impact on the Greater Glider, Swift Parrot, Regent Honeyeater nor any other MNES.

The proposed action will have a significant residual impact on the Koala and Grey-headed Flying-fox, requiring compensatory works in the form of land-based offsets under the EPBC Act and *EPBC Environmental Offsets Policy 2012*. The offset proposal is discussed further in **Section 6** and **Attachment A9**.

6 Proposed Offsets

The DCCEE state that, *'in the event that there are significant impacts that cannot be avoided or mitigated, an offset to compensate for any predicted or potential residual significant impacts on threatened species and ecological communities must be provided for each protected matter.'*

This section responds to Item 6 of the PD request which requests further details on proposed offsets. Item 6.1 of the PD Request advises the response must **'Demonstrate how the offset proposal:**

- a) Meets the principles outlined in the EPBC Offsets Policy.**
- b) Addresses the considerations and requirements outlined in the EPBC Environmental Offsets Policy, including but not limited to sections 6 and 7 of the EPBC Offsets Policy.**
- c) Directly contributes to the ongoing viability of the EPBC listed species or ecological community and will deliver an overall conservation outcome that improves or maintains the viability of the protected matter, as compared to what is likely to have occurred under the status quo, i.e. if neither the action nor the offset had taken place.**
- d) Compensates for the impact over the entire duration of the impact (i.e. should impacts be in perpetuity, the offsets must also be delivered in perpetuity) 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.**
- e) Is like-for-like, i.e., the environmental values of the offset are of the same type or equivalent to that affected by the proposed action.**

Note: while the offsets do not need to be secured before the decision on whether to approve the proposed action, should the proposed action be approved, conditions of an approval are likely to require that offsets are secured, and management measures are in place, before commencement of the proposed action'.

6.2 Attachment B of the PD request also includes a list of additional details which must be provided to support the offset proposal.

6.1 Offset Proposal

The proponent intends to provide a direct land-based offset secured through an experienced offset provider to compensate for the unavoidable loss of 19.1 ha of habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox (refer **Figure A5** and **Figure A6**).

As determined in **Section 5.4** the MHQA analysis found that habitat quality for the Koala scored a 6.25 out of 10 (rounded scored of 6) while the GHFF FHA demonstrated a score of 5.85 out of 10 (rounded score of 6). Resultantly, the action is considered to result in a Quantum of Impact for the Koala of 13.3.7 ha and GHFF 11.46 ha.

The offset site is currently zoned as Rural and is located within a State designated corridor. Refer to **Attachment A9** Offset Management Plan (OMP) for further details.

The offset site is considered to have the capacity to meet the offset requirements, with the presence of open paddocks and scattered and patchy vegetation to be improved to provide habitat. In addition, the location of the offset site within a State corridor ensures the land will continue to provide habitat and fauna connectivity within the greater landscape. Upon EPBC Act approval, the offset will be legally secured by a Voluntary Declaration (VDEC) under the State Vegetation Management Act and a permanent securing mechanism agreed with the Department.

The object of the OMP is to summarise existing habitat quality for the Koala (*Phascolarctos cinereus*) and GHFF (*Pteropus poliocephalus*) within the offset area and to provide management actions designed to achieve the improvements targets stipulated. The environmental outcomes to be achieved through implementing the OMP for the offset area are:

- Increase in the number of available food trees at the offset site.
- Increase species richness in all layers to benchmark where required.
- Maintain and improve tree canopy height and cover to benchmark.
- Maintain and improve shrub cover to benchmark.
- Maintain native grass cover to benchmark.
- Improve organic litter cover to benchmark.
- Improve coarse woody debris habitat.
- Reduce non-native plant cover.
- Improve quality and availability of food, foraging and shelter habitat.
- Decrease threats to species.
- Improve species mobility capacity.
- Maintain species stocking rate.

The OMP identifies outcomes focused management actions pursuant the EPBC Act, for the provision of Koala (*Phascolarctos cinereus*) and GHFF (*Pteropus poliocephalus*) 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 GHFF.
- Provide a direct offset that is in proportion to the level of statutory protection that applies to Koala habitat and GHFF foraging habitat.
- Be of a size and scale proportionate to the residual impacts on Koala habitat and GHFF foraging habitat.

- Effectively account for and manage the risks of the offset not being successful within the required management timeframe.
- Provide a conservation gain additional to what is already required by a duty of care or to any environmental planning laws at any level of Government.
- Be efficient, effective, timely, transparent, scientifically robust and reasonable with appropriate transparent governance arrangements in place for measuring, monitoring, auditing and enforcing the management of the offset area. For an assessment for the offset site suitability, refer to **Attachment A9 Section 5**.

The achievement of environmental outcomes within the offset area will be measured using methodologies, monitoring and maintenance detailed in **Attachment A9** and the **Tables** below. The management actions detailed in the OMP aim to achieve the offset targets to be conditioned in the EPBC Act approval that endeavour to protect, restore and reconnect areas of Koala and GHFF habitat. The offset areas have been selected to represent populations that are genetically diverse and distinct and are free of disease or have very low incidence of disease.

The approval holder must apply management actions to achieve the prescribed outcomes in all operational management units at the offset site.

The relevant benchmarks, baseline survey results and outcomes are provided in **Attachment A9** and **Tables** below.

Baseline surveys for Koala and GHFF habitat scores followed methods outlined in **Sections 4.4.1** and **4.4.2**. Field surveys utilising the methods outlined in the following subsections were conducted to describe ecological value of the offset area. Targeted MNES flora and fauna surveys were undertaken as per **Table A33**.

Table A33: Offset Site Field Survey Methods Summary

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

7th October 2025 11.1°C min – 0 mm Weed mapping and transects
35.6°C max

Source: Bureau of Meteorology – Station 040082 University of Queensland Gatton

The proposed offset area includes three assessment units as outlined in **Attachment A9** summarised below in **Table A34**.

Table A34: Offset Site Assessment Unit Summary

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

The required number of MHQA transects were applied per assessment unit (refer to **Plan A11**). In order to determine the quantum and quality of the habitat suitable for Koala within the offset area, vegetation/habitat quality was derived from the Modified Habitat Quality Assessment tool relevant to each species. 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 referral area. The Modified Habitat Quality Assessment (MHQA) methodology was utilised to assess the offset area condition, site context and species stocking rate.

Spot Assessment Technique (SAT) surveys were applied to estimate Koala activity levels as described within **Section 3.3.1** following Philips & Callaghan (2011).

The offset site was also assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by the Saunders Havill Group 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 (refer **Section 4.4.2** for further details). Field surveys included assessment of foraging species stem densities at each MHQA Transect location (refer to **Plan A11**). Counts of foraging species were conducted over 0.2 hectare to derive per hectare stem densities as per the FHA methodology.

For spotlighting, the requirement to cover a total distance of as close to 1 km as possible per transect was targeted at a pace of 10 minutes per 100 m, as outlined within The Department of Environment, Land, Water and Planning Forest Protection Survey Program *Survey Guideline – Spotlighting and Call Playback* (2020) (version 4.1) and Conservation Regulator Victoria *Guidance Note: Reporting detections of Greater Gliders*

(2021). Multiple transects were conducted for each day of surveys to meet the total of 1 km requirement of the guideline.

Infrared fauna camera trapping as applied at the offset site to detect fauna activity in the absence of observers. Camera trapping involves setting up a fixed digital camera to capture images or video of animals that pass in front of a camera with an infrared trigger. It is a non-invasive technique designed to detect medium to large sized animals as they pass across it, although it is possible to detect smaller animals depending on the set-up. This method identifies fauna activity beyond the scope of direct observational studies and with the absence of potential observer impacts.

Infrared sensing cameras with an infrared flash that use motion to trigger were deployed. Six (6) cameras were installed across the subject site in a grid formation (refer to **Plan A11**). Cameras were attached 30-100 cm from the ground on a tree or post and directed towards landscape features. Six (6) camera traps were installed across the proposed offset area for a period of 19 nights from 21st August 2025 to 9th September 2025, baited with chicken necks to target wild dogs and other known potential threats to MNES in the broader area.

For inventory surveys, cameras were placed in the vicinity of an assumed animal trail within remnant areas more likely to support fauna. Heavy, loose vegetation was avoided as this can cause false triggering, and the camera was aimed to avoid sun shining directly onto the lens. The camera position was directed towards an area away from other frequent survey activity.

All fauna species observed during the offset site surveys were recorded. Refer to **Table A35** for offset site fauna records.

Table A35: Fauna recorded during offset site field surveys

Scientific Name	Common Name	Native / Introduced	Method
Birds			
<i>Dacelo novaeguineae</i>	Laughing Kookaburra	Native	Camera
Mammals			
<i>Canis lupus familiaris</i>	Dog	Introduced	Camera
<i>Cervus elaphus</i>	Red Deer	Introduced	Camera
<i>Felis catus</i>	Cat	Introduced	Camera
<i>Macropus parryi</i>	Whiptail Wallaby	Native	Camera
<i>Macropus rufogriseus</i>	Red-necked Wallaby	Native	Camera

6.1.1 Koala Offset Score

Assessment units, field surveys and context analyses supporting the MHQA analysis for Koala habitat on the offset site are presented in **Plans A11** and **A12**. For the purpose of this analysis, Site Condition attributes

were applied to the offset area as extrapolated from the broader offset site data (**Plan A11** and also **Plan A12**).

Baseline MHQA analyses for the Koala based on each Assessment unit are provided below in **Tables A36 to A42**. Data sheets are provided in **Attachment A9**.

Table A36: Offset AU1 MHQA Score

Assessment Unit - Regional Ecosystem	AU 1 - Cat X (Paddock) RE12.12.5					
	RE12.12.5 Benchmark	Transect 1	Transect 2	Average of Transect(s)	% Benchmark	Score
<u>SITE CONDITION</u>						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	2	4	3	60.00	2.5
Native plant species richness - shrubs	9	3	3	3	33.33	2.5
Native plant species richness - grasses	11	2	3	2.5	22.73	0
Native plant species richness - forbs	17	1	5	3	17.65	0
Tree canopy height (Canopy)*	22	20	22	21	95.45	5
Tree canopy height (Sub-canopy)*	9	0	11	5.5	61.11	4
*Average tree canopy height						5
Tree canopy cover (Canopy)**	41	4.1	35.2	19.65	47.93	2
Tree canopy cover (Sub-canopy)**	10	0	29.5	14.75	147.50	5
**Average tree canopy cover						3.5
Shrub canopy cover	3	1.3	2.9	2.1	70.00	5
Native grass cover*	35	36	41	38.5	110.00	5
Organic litter*	35	2	14	8	22.86	3
Large trees (euc plus non-euc) (per ha)	29	4	2	3	10.34	5
Coarse woody debris (per ha)	578	0	202	101	17.47	2
Non-native plant cover	0	65	45	55	55.00	0
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	4	4	4	-	4
Site Condition Score (/160)						61.5
Overall Site Condition Score - out of 3						1.15
<u>SITE CONTEXT</u>						
Size of patch		0	0	0		0

Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						33
Overall Site Context Score - out of 3						1.77
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	30	30	30		30
Species Stocking Rate Score (/70)						30.00
Overall Species Stocking Rate Score - out of 4						1.71
Overall Assessment Unit Score						4.64

Species Stocking Rate (SSR) Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 – SAT Surveys detected low Koala usage on-site
Species usage of the referral area (habitat type and evidenced usage)	5/15 – Dispersal
Approximate density (per ha)	10/30 – SAT surveys detected low usage
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	30/70
SSR Score – out of 4	2.29
SSR Supplementary Table	
*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
Score	5/45

Table A37: Offset AU1 MHQA Score

Assessment Unit - Regional Ecosystem	AU 2 - Cat X (Vegetated) RE12.12.5					
	RE12.12.5 Benchmark	Transect 3	Transect 6	Average of Transect(s)	% Benchmark	Score
<u>SITE CONDITION</u>						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	4	4	4	80.00	2.5
Native plant species richness - shrubs	9	7	4	5.5	61.11	2.5
Native plant species richness - grasses	11	3	2	2.5	22.73	0
Native plant species richness - forbs	17	5	8	6.5	38.24	2.5
Tree canopy height (Canopy)*	22	20	19	19.5	88.64	5
Tree canopy height (Sub-canopy)*	9	9	10	9.5	105.56	5
*Average tree canopy height						5
Tree canopy cover (Canopy)**	41	31.3	40.3	35.8	87.32	5
Tree canopy cover (Sub-canopy)**	10	32.3	18.7	25.5	255.00	3
**Average tree canopy cover						4
Shrub canopy cover	3	6.6	6.5	6.55	218.33	3
Native grass cover*	35	53	36	44.5	127.14	5
Organic litter*	35	13	15	14	40.00	3
Large trees (euc plus non-euc) (per ha)	29	6	4	5	17.24	5
Coarse woody debris (per ha)	578	59	0	29.5	5.10	0
Non-native plant cover	0	30	70	50	50.00	3
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	20	20	20	-	20
Site Condition Score (/160)						80.5
Overall Site Condition Score - out of 3						1.51
<u>SITE CONTEXT</u>						
Size of patch		10	10	10		10

Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						43
Overall Site Context Score - out of 3						2.30
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	40	40	40		40
Species Stocking Rate Score (/70)						40.00
Overall Species Stocking Rate Score - out of 4						2.29
Overall Assessment Unit Score						6.10

Species Stocking Rate (SSR) Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 – SAT Surveys detected low Koala usage on-site
Species usage of the referral area (habitat type and evidenced usage)	15/15 – Foraging/Breeding
Approximate density (per ha)	10/30 – SAT surveys detected low usage
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	40/70
SSR Score – out of 4	2.29
SSR Supplementary Table	
*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
Score	5/45

Table A38: Offset AU3 MHQA Score

Assessment Unit - Regional Ecosystem	AU3 - Cat B RE12.12.5					
	RE12.12.5 Benchmark	Transect 4	Transect 5	Average of Transect(s)	% Benchmark	Score
<u>SITE CONDITION</u>						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	5	3	2	2.5	50.00	2.5
Native plant species richness - shrubs	9	5	7	6	66.67	2.5
Native plant species richness - grasses	11	3	3	3	27.27	2.5
Native plant species richness - forbs	17	6	12	9	52.94	2.5
Tree canopy height (Canopy)*	22	21	18	19.5	88.64	5
Tree canopy height (Sub-canopy)*	9	10	9	9.5	105.56	5
*Average tree canopy height						5
Tree canopy cover (Canopy)**	41	45.8	57.9	51.85	126.46	5
Tree canopy cover (Sub-canopy)**	10	22.2	20.1	21.15	211.50	3
**Average tree canopy cover						4
Shrub canopy cover	3	8.8	14.8	11.8	393.33	3
Native grass cover*	35	73	46	59.5	170.00	5
Organic litter*	35	1	10	5.5	15.71	3
Large trees (euc plus non-euc) (per ha)	29	4	8	6	20.69	5
Coarse woody debris (per ha)	578	52	116	84	14.53	2
Non-native plant cover	0	55	70	62.5	62.50	0
Quality and availability of food and foraging habitat	NA	20	20	20	-	20
Quality and availability of shelter	NA	20	20	20	-	20
Site Condition Score (/160)						82
Overall Site Condition Score - out of 3						1.54
<u>SITE CONTEXT</u>						
Size of patch		10	10	10		10

Connectedness		4	4	4		4
Context		4	4	4		4
Ecological Corridors		6	6	6		6
Role of site location to species overall population in the state		5	5	5		5
Threats to the species		7	7	7		7
Species mobility capacity		7	7	7		7
Site Context Score (/56)						43
						2.30
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s))	70	40	40	40		40
Species Stocking Rate Score (/70)						40.00
Overall Species Stocking Rate Score - out of 4						2.29
Overall Assessment Unit Score						
						6.13

Species Stocking Rate (SSR) Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 – SAT Surveys detected low Koala usage on-site
Species usage of the referral area (habitat type and evidenced usage)	15/15 – Foraging/Breeding
Approximate density (per ha)	10/30 – SAT surveys detected low usage
Role/importance of species population on site*	5/15
Total Species Stocking Rate Score	40/70
SSR Score – out of 4	2.29
SSR Supplementary Table	

*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
Score	5/45

Table A39: Foraging Scoring

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

Table A40: Shelter Scoring

AU	1	2	3
Stems			
Transect	1	2	3
Stem Count	5	6	9
Stems/ha	25	30	45
Mean S/ha	130	150	225
Benchmark	680	680	680
%Benchmark	19.12	22.06	33.09
Stem Score	2	2	3
Cover Score	1	1	1
Shelter Total	3	3	4
Shelter Score	20	20	20

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

Table A41: Threats Matrix Scoring

Metric	Low	Moderate	High
Clearing and Degradation of Habitat	Apply one of the following options in order of priority: 1. Apply a current legal protective mechanism. 2. The site is zoned for conservation purposes or clearing is not permitted. 3. If $\leq 30\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: $>30\%$ and $<70\%$ of the area within a 5km buffer of the site is cleared or disturbed land.	Apply one of the following options in order of priority: 1. The site is zoned for development 2. If $\geq 70\%$ of the area within a 5 km buffer of the site is cleared or disturbed land.
Score Weighting	6	2.8	0.4

Metric	Low	Moderate	High
Inappropriate Fire Regimes - Very High Risk	Current Government endorsed Bushfire Management Plan (BMP) including specific measures to protect the Koala is in effect.	Moderate potential bushfire risk identified by State or Local government within or adjacent to (<100m) the site. OR A site-specific BMP is in effect.	High or very high bushfire risk identified by State or Local government within or adjacent to (<100m) the site.
Score Weighting	6	2.8	0.4
Vehicle Strike - Moderate Risk	Located more than 1km from a major road AND Fauna safe design features in place between the site and any minor roads within 500m	Located <500m from a major road with fauna safe design features) OR Located <1km from a major road accessible for koalas (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m	Located <500m from a major road (no fauna safe design) AND Minor roads servicing residential or industrial areas are located within 500m
Score Weighting	1.5	0.7	0.1

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

Table A42: Mobility Scoring

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

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Quadrant	Description	Rating	%
Average			30
Score		Moderate restriction	7

Site Condition (30%)

The habitat quality scores for the assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A36** to **Table A38**. The scores for Site Condition are derived directly from the MHQA tool data. Quality and Availability of Food and Foraging Habitat, and Quality and Availability of Shelter area scored as per the methodology (**Table A39** and **Table A40**).

Site Context (30%)

Site context scores discussed below are applied to each Assessment Unit.

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 it reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS and determined the offset area to be part of a patch size of >200 ha. This component was assigned a score of **10** out of **10** (refer **Plan A13**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected to adjacent native vegetation. Connectedness relates to the capacity of the species to disperse through the landscape between sustainable patches of habitat, and therefore has important implications for species persistence. Connectedness was calculated using GIS, with the percentage of referral area boundary length supporting a Koala critical habitat connection off and on site was calculated at 57.4%, and consequently this attribute scored a **4** out of **5** as per the *Queensland BioCondition Assessment* methodology (**Plan A13**).

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. Each assessment unit achieved the same scores for Site context.

Retained critical Koala habitat within a 1 km buffer of the site was calculated at 65.5%, and therefore the context attribute achieved a score of **4** out of **5** as per the methodology (**Plan A13**).

Ecological Corridors

GIS was utilised to identify the site's role in any ecological corridors on or adjacent to the site). This attribute was scored **6** out of **6**, as the site is mapped within an ecological corridor.

Role of site location to species overall population in the State

This attribute aims to quantify the geographical importance of the referral area for Koala populations across the broader State. This attribute achieved a score of **5** out of **5**.

Threats to the species

The 'threats to the species' attribute quantifies potential risks to the survival of Koala existing within and adjacent to the offset 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. Refer also **Plan A14** and **Attachment 9 Section 9.4** for additional information. This attribute was scored a **7** out of **15** for the offset site as per the methodology (refer **Table A41**).

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 especially important in response to rapid changes to the surrounding environment, such as the commencement of land clearing. GHFF and avi-fauna for example are considered highly mobile species due to their ability to fly quickly and over land barriers such as highly frequented roads or residential developments. Conversely, the Koala is considered a relatively immobile species due to it being an arboreal species, moving relatively slowly and hence its vulnerability to threats on-ground as outlined above.

In this instance, the species mobility capacity for the Koala on-site was assigned the score of **7** out of **10** as per the methodology (refer **Table A42**).



Photo Set 1: Dog recorded on the offset site.

Species Stocking Rate (40%)

The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Koala carrying capacity of the assessment unit at the time of undertaking the survey. A species stocking rate score of 30 or 40 out of 70 was attributed to the AUs based on the SSR calculation tables.

Species stocking rate characteristics reflect presence of Koala activity detected on-site (if no scats no density and dispersal habitat), foraging and breeding as per conservation advice as evidenced by the presence scats, approximate density from SAT results and role of the site from the supplementary table noting no key source population occurs or adjoining the site.

Assessment Unit baseline MHQA scores are summarised in **Table A43**, below.

Table A43: Offset Site Assessment Unit MHQA Scores

Assessment Unit	MHQA Score	Score rounded out of 10
AU1	4.65	5
AU2	6.10	6
AU3	6.13	6

Proposed uplift in Koala MHQA scores with justifications and management actions, monitoring protocols and Key Performance Indicators (KPIs) and adaptive management strategies are summarised in **Table A44** and **Table A45**, below. Refer **Attachment A9** for further detailed breakdown of the management actions that will achieve the uplift.

Table A44: Offset Site Management Summary

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

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

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

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

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

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

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

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

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

Table A45: OMP Management Actions Reference Table

Management Action	OMP Section	Performance Targets	Completion criteria
Management Action 1 – Legally Secure Offset Area	9.3	Not applicable	- The offset area is legally secured for conservation via a suitable method. This will be via a Voluntary Declaration (VDEC) process administered under the Queensland <i>Vegetation Management Action 1999</i> prior to the impacts occurring followed by a permanent securing method agreed with the Department. - The Department is notified of the legal securement within 5 business days of commencing the implementation of the OMP <i>i.e.</i>, the date from which the offset area is legally secured. - The offset area is not used for other purposes – site access is restricted.
Management Action 2 – Non-native Vertebrate Pest Management	9.4	- Development and implementation of a property-wide feral animal management program specifying techniques (trapping, baiting, shooting) and ongoing monitoring methods (including datasheets) to be utilised will be completed within <u>Year 1 of the offset</u>. - A suitably qualified pest management contractor will be engaged to manage pests within the offset area for the life of the offset.	Non-native vertebrate pests and evidence of pests are suppressed within the offset area.
Management Action 3 – Management of Weeds of National Significance (WONS)	9.5	- Establish photo monitoring locations in <u>Year 1 of the offset</u> to allow monitoring of any subsequent increase in WONS extent. - All WONS will receive on-going maintenance. - Follow-up treatment of WONS will occur <u>annually</u> or as determined by the suitably qualified regeneration contractor.	The management actions must maintain the extent of WONS weed cover below 5% of the offset area for the life of the offset (20 years).
Management Action 4 – Bushfire Management Plan	9.6	A Bushfire Management Plan (BMP) will be developed and implemented in accordance with relevant Queensland guidelines and endorsed by an experienced bushfire practitioner to reduce potential threats from fires to Koala.	- Firebreaks and fuel loads are maintained through the life of the offset. - Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes.
Management Action 5 – Habitat Creation and Regeneration	9.7	By the end of Year 5, Site condition metrics for Koala have improved in accordance with environmental outcomes.	- Rehabilitated areas are established, regenerated and mapped as per milestone table outcomes. - Site condition metrics for Koala improves in accordance with environmental outcomes.

Management Action 6 – Fencing and Signage 9.7

- Fencing and signage is installed and retrofitted by the end of Year 1 of the offset and maintained for the life of the offset (20 years).
 - All fencing and signage has been installed, retrofitted and maintained for the life of the offset.
 - The risk of mortalities or injury to Koala as a result of barbed-wire fencing is mitigated.
 - Fencing enables Koala to move through he offset area and into surrounding land.
 - The risk of stock breaches or unauthorised access is mitigated. If stock breaches or unauthorised access is observed, fencing is rectified within 2 weeks.
-

As per **Tables A44 to A45** and **Attachment A9**, the summary of score uplift is presented in **Table A46**, below. Offset acquittal is taken from the offset calculator outputs presented in **Attachment A9**. The proposed offset will acquit **151.94%** of the quantum impact.

Table A46: Koala MHQA Uplift Summary

Assessment Unit	Area	Koala Habitat Quality Score		Offset Acquittal
		Baseline	Future	
AU1	36.3 ha	5	8	68.48%
AU2	50.5 ha	6	8	63.51%
AU3	14.0 ha	6	8	19.95%
Total	100.8 ha			151.94%

6.1.2 GHFF Offset Score

Assessment Units for the offset site GHFF-FHA are as per the Koala assessment (**Plan A12**). The offset GHFF-FHA habitat quality uplift analysis is presented in **Table A47** and **Attachment A9** and **Plan A15**.

Table A47: Offset Site GHFF-FHA Summary

Assessment Unit - Regional Ecosystem	AU 1 Non-remnant RE12.12.5 paddock											
Site Reference	Transect 1	Transect 2	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management	
Vegetation Condition	5	5	5	5	5	5	10	20	Remnant status will be achieved as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Remnant status will be achieved by 20 years. If regrowth status is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings and extension of the offset period where required.	
Species Richness	2	4	3	5	5	5	10	10	Tree species richness will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.	

Flower Score	0.755	0.64	0.6975	8	8	8	10	10	Flower score will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Flower score will improve to average 0.76 by 15 years. If the target flower score is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.
Timing of Biological Shortages	8.5	8.5	8.5	8.5	8.5	8.5	10	10	Timing of biological shortages will improve to 10 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should timing of biological shortages not improve to 10 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Quality of Foraging Habitat	2	3	2.5	5	5	5	10	10	Quality of foraging habitat will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Foraging tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.

Non-native Plant Cover	65	45	55.00	1	10	20	20	20	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3, 4 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 55% of the benchmark. If improvement toward below 5% has not been achieved by the end of Year 5 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score				32.50	41.50	51.50	70.00	80.00			
MAX Site Condition Score				100	100	100	100	100			
Site Condition Score - out of 4				1.30	1.66	2.06	2.80	3.20			
Size of patch	>200ha	>200ha	10	10	10	10	10	10	NA	NA	NA
Connectedness	1 active camps within 20km	1 active camps within 20km	3	3	3	3	3	3	NA	NA	NA
Context	49.6%	49.6%	6	6	6	6	6	6	NA	NA	NA
Ecological Corridors	Within	Within	10	10	10	10	10	10	NA	NA	NA
Role of site location to species overall population in the state	1 active level 3 camp	1 active level 3 camp	1	1	1	1	1	1	NA	NA	NA
Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table A45 .	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	5	47									

GHFF Foraging Tree Density - per hectare	25	235	130	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				4.25	4.86	5.26	6.60	7.00			

Assessment Unit - Regional Ecosystem	AU 2 Non-remnant RE12.12.5 vegetated										
Site Reference	Transect 3	Transect 6	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	5	5	5	5	5	5	10	20	Remnant status will be achieved as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Remnant status will be achieved by 20 years. If regrowth status is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings and extension of the offset period where required.
Species Richness	3	3	3	5	5	5	10	10	Tree species richness will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.

Flower Score	0.64	0.72	0.6800	8	8	8	10	10	Flower score will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Flower score will improve to average 0.76 by 15 years. If the target flower score is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.
Timing of Biological Shortages	8.5	8.5	8.5	8.5	8.5	8.5	10	10	Timing of biological shortages will improve to 10 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should timing of biological shortages not improve to 10 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Quality of Foraging Habitat	3	3	3	5	5	5	10	10	Quality of foraging habitat will improve to a score of 10 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Foraging tree species richness will improve to 4 species by 15 years. If the target species richness is not achieved by 15 years, then remedial actions will be required. These will include advanced stock plantings.

Non-native Plant Cover	30	70	50.00	5	10	20	20	20	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3, 4 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 55% of the benchmark. If improvement toward below 5% has not been achieved by the end of Year 5 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score				36.50	41.50	51.50	70.00	80.00			
MAX Site Condition Score				100	100	100	100	100			
Site Condition Score - out of 4				1.46	1.66	2.06	2.80	3.20			
Size of patch	>200ha	>200ha	10	10	10	10	10	10	NA	NA	NA
Connectedness	1 active camps within 20km	1 active camps within 20km	3	3	3	3	3	3	NA	NA	NA
Context	49.6%	49.6%	6	6	6	6	6	6	NA	NA	NA
Ecological Corridors	Within	Within	10	10	10	10	10	10	NA	NA	NA
Role of site location to species overall population in the state	1 active level 3 camp	1 active level 3 camp	1	1	1	1	1	1	NA	NA	NA
Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table A45 .	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	80	44									

GHFF Foraging Tree Density - per hectare	400	220	310	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table A45.	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				4.41	4.86	5.26	6.60	7.00			

Assessment Unit - Regional Ecosystem	AU 3 Remnant RE12.12.5										
Site Reference	Transect 4	Transect 5	Average Score	AU Score	5 years	10 years	15 years	20 years	Justification / management Actions / Timing	Monitoring	KPIs and Adaptive Management
Vegetation Condition	20	20	20	20	20	20	20	20	Remnant status will be maintained as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Remnant status will be maintained. Remedial actions not required.
Species Richness	3	2	2.5	5	5	5	5	10	Tree species richness will be maintained as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness will be maintained. Remedial actions not required.
Flower Score	0.72	0.4333	0.5767	8	8	8	8	8	Flower score will be maintained as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Flower score will be maintained. Remedial actions not required.

Timing of Biological Shortages	8.5	4	6.25	6.25	6.25	6.25	6.25	8.5	Timing of biological shortages will improve to 10 as per transect 31 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should timing of biological shortages not improve to 10 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Quality of Foraging Habitat	3	2	2.5	5	5	5	5	10	Quality of foraging habitat will be maintained as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat will be maintained. Remedial actions not required.
Non-native Plant Cover	55	70	62.50	1	10	20	20	20	Weed coverage will reduce to less than 5% over the course of 10 years by specific management actions 3, 4 & 5 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed cover is currently 10.33% of the benchmark. If improvement toward below 5% has not been achieved by the end of Year 5 then then remedial actions to reduce weed cover will be applied. These include refining weed control methods.
Site Condition Score				67.00	54.25	64.25	64.25	76.50			
MAX Site Condition Score				100	100	100	100	100			
Site Condition Score - out of 4				2.68	2.17	2.57	2.57	3.06			
Size of patch	>200ha	>200ha	10	10	10	10	10	10	NA	NA	NA
Connectedness	1 active camps within 20km	1 active camps within 20km	3	3	3	3	3	3	NA	NA	NA
Context	49.6%	49.6%	6	6	6	6	6	6	NA	NA	NA
Ecological Corridors	Within	Within	10	10	10	10	10	10	NA	NA	NA

Role of site location to species overall population in the state	1 active level 3 camp	1 active level 3 camp	1	1	1	1	1	1	NA	NA	NA
Threats to the species	5	5	5	5	10	10	10	10	Threats to species including barbed wire fencing will be removed by specific management action 6 outlined in Table A45 .	Baseline attributes are established. This criterium is reliant upon removal of barbed wire threats.	The removal of barbed wire threats will provide an immediate reduction in threat levels.
Site Context Score				35	40	40	40	40			
MAX Site Context Score				60	60	60	60	60			
Site Context Score - out of 3				1.75	2.00	2.00	2.00	2.00			
GHFF Foraging Tree Density - Recorded	49	68									
GHFF Foraging Tree Density - per hectare	245	340	292.5	4	4	4	6	6	Foraging tree density will improve to score 6 as a result of specific management actions 1 to 6 outlined in Table A45 .	Baseline Site Condition attributes are established. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Should foraging tree density not improve to score 6 by 15 years, then remedial actions will be required. These include remedial plantings of advanced stock.
Species Stocking Rate Score				4	4	4	6	6			
MAX Species Stocking Rate Score				10	10	10	10	10			
Species Stocking Rate Score - out of 3				1.20	1.20	1.20	1.80	1.80			
Total				5.63	5.37	5.77	6.37	6.86			

As per **Table A47** and **Attachment A9**, the summary of score uplift for GHFF is presented in **Table A48**, below. Offset acquittal is taken from the offset calculator outputs presented in **Attachment A9**. The proposed offset will acquit 170.73% of the quantum impact.

Table A48: GHFF-FHA Uplift Summary

Assessment Unit	Area	GHFF Habitat Quality Score		Offset Acquittal
		Baseline	Future	
AU1	36.3 ha	4	7	68.48%
AU2	50.5 ha	4	7	95.27%
AU3	14.0 ha	6	7	9.98%
Totals	100.8 ha			170.73%

7 Habitat Quality Assessment

Refer Sections 4.4.1 and 4.4.3.

8 Economic and Social Matters

This section responds to Item 8 of the PD request which requests further details on economic and social matters.

8.1 Economic and Social Benefits

Item 8.1 of the PD Request advises the response must ***“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.”***

The referral area is located within Ripley Valley, Ipswich, Queensland. The Ripley Valley is located in the western growth corridor of SEQ, approximately 5 km southeast of Ipswich CBD and 30 km southwest of the Brisbane CBD. In 2009, Ripley Valley was identified under the SEQRP 2009-2031 by the State Government because of its potential to absorb a vast portion of the regional area’s population over the two-decade timeframe. The SEQRP suggests a high population influx to the region with projections of 120,000 residents needing to be accommodated in more than 50,000 dwellings. The SEQRP 2017 (Shaping SEQ) recognises Ripley Valley as a large residential expansion area with an expected dwelling capacity of 30,000 by 2041 supported by the Ipswich to Springfield public transport corridor, which will strengthen economic and social connections within the sub-region and proximity to employment opportunities.

The RVPDA was declared by the Department of State Development, Infrastructure and Planning on the 8th October 2010 and covers a total area of 4,680 hectares southwest of Ipswich in SEQ. The PDA is intended to provide 50,000 dwellings for 120,000 people in one of the fastest growing regions of SEQ.

Social impacts have been a key consideration in the design and planning of the project and more broadly the RVPDA Development Scheme. Under the provisions of the PDA, 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 proposed action will provide education facilities for the residents of Ripley as well as providing employment opportunities via staffing requirements of the future school.

The RVPDA is forecast to experience notable growth in population, employment and residential dwellings from the base year (2020) to the ultimate development year (2066). **Table A49** and **Table A50** identify the source information, and revised projections of population, employment, and dwellings for the area which have informed the Ripley Valley Development Charges and Offsets Plan (DCOP) planning assumptions (Department of State Development, Infrastructure, Local Government and Planning (DSDILGP), 2022).

Table A49: Extract RVPDA Infrastructure Plan Background Report Table 2.6.1 Growth Projections for the Ripley Valley PDA – Identified within SGS Demographic Analysis Report

	2020 DCOP Base Date	2026 Projection year	2031 Projection year	2041 Projection year	2066 Ultimate development
Population	10,930	33,522	56,740	94,493	135,001
Employment (jobs)	1,824	4,083	6,405	10,180	14,231
Average household (occupancy rate)	3.00	3.00	3.00	2.90	2.70
Residential dwellings	3,643	11,174	18,913	32,584	50,000

Following preparation of the SGS Economics & Planning demographic analysis, planning processes identified that an additional 4 primary school sites, 2 secondary school sites, 2 ambulance sites, 1 health centre precinct and 1 urban and fire rescue site were necessary, requiring additional land. To appropriately reflect the ultimate capacity of the PDA, the following adjustments were made to the growth projections:

- Non-residential yield – No change. Additional sites assumed to be required in residential areas
- Residential yield – Reduction to ultimate residential dwelling yield of 1,250 dwellings to accommodate the additional state community facility sites
- This capacity reduction is not anticipated to impact the growth rate identified in the Demographic
- Analysis, and on this basis has been applied only to the 2066 ultimate development.

Table A50: Extract RVPDA Infrastructure Plan Background Report Growth projections for the Ripley Valley PDA – Adopted for DCOP

Table 2.6.2 Growth projections for the Ripley Valley PDA – Adopted for DCOP

	2020 DCOP Base Date	2026 Projection year	2031 Projection year	2041 Projection year	2066 Ultimate development
Population	10,930	33,522	56,740	94,493	131,626
Employment (jobs)	1,824	4,083	6,405	10,180	14,231
Average household (occupancy rate)	3.00	3.00	3.00	2.90	2.70
Residential dwellings	3,643	11,174	18,913	32,584	48,750

The community facilities infrastructure requirements have been determined based on the projected population growth. Indicative sequencing of community facilities has been determined having regard to:

- Population projections and the timing of when population benchmarks are likely to be reached
- Input from relevant state agencies
- The projected areas of population density and establishing what catchments within the community facilities network will be most utilised.
- The surrounding road network, acknowledging that access to the site will need to be provided before the community facility can be operational. Additionally, areas with topography restrictions and access constraints may trigger earlier, indirect community facility location sequencing

Through the investigation of spatial data and feedback received from the key agencies, the following Educational facilities outlined in **Table A51** are to be provided within the RVPDA. Plat A1 (extract from RVPDA Appendix D: Technical Report Figure 10-5 Ripley Valley Adopted State Community Facilities) shows that a primary and Secondary School located within the referral area.

Table A51: Extract RVPDA Appendix D: Technical Report Table 10-6 Consolidated Recommendation

	Education - Department of Education (DoE) - Based on consideration of accessibility via projected road networks, initial sequencing appears to be logical as follows, noting more factors may be considered for detailed sequencing: 4 primary schools and 1 secondary school to be delivered by 2026 (excluding the existing site), 5 primary schools and 1 secondary school to be delivered by 2031, 3 primary schools and 2 secondary school to be delivered by 2041, and 4 primary schools and 3 secondary schools to be delivered after 2041.
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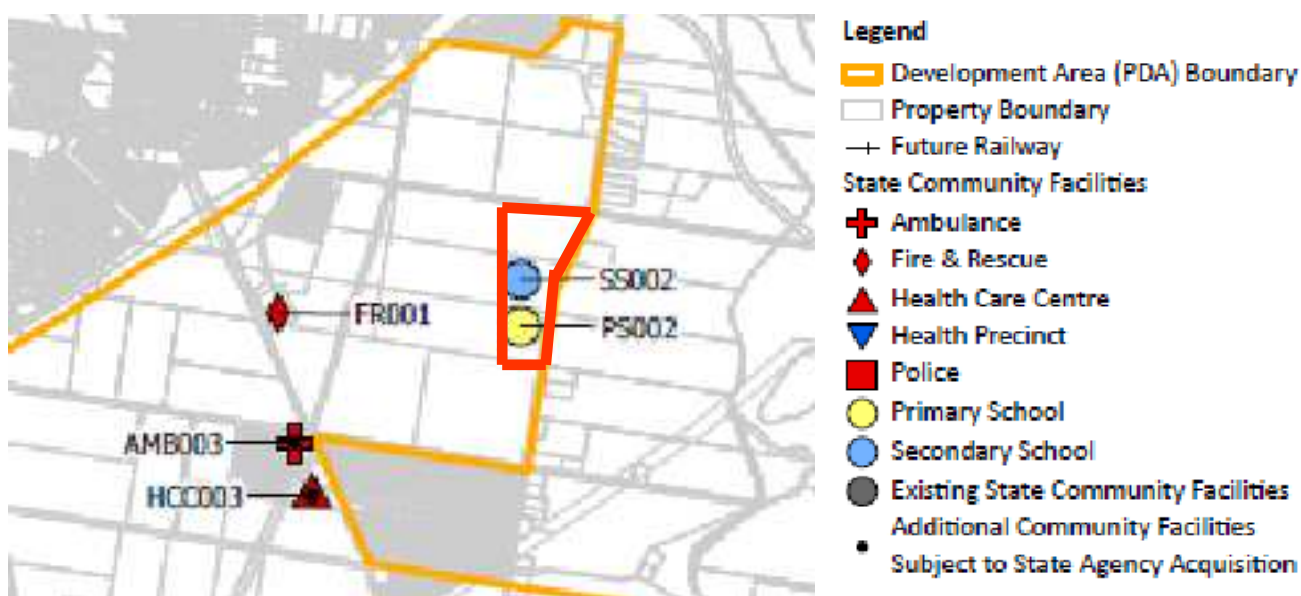


Plate A1: Extract RVPDA Appendix D: Technical Report Figure 10-5 Ripley Valley Adopted State Community Facilities

Ripley Valley household size will be expected to remain slightly above the QLD average household size of 2.6 persons per household and the largest amount of population growth for the area are young families aged between 30-49. With this, SGS has forecasted primary school aged children (5-11 years) living in Ripley Valley to increase by 12,400 people and secondary school aged children (12-17 years) to increase by 10,400 people to 2066. This trend clearly has implications for future school provision.

With the continuous growth in the area, it is essential to be able to establish new schools at the appropriate time to meet the demand. The provision of both primary and secondary school on this reference site will benefit not only the community but also create more employment opportunities.

8.2 Economic Benefits and Employment Opportunities

Item 8.2 of the PD Request advises the response must ***“Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.”***

SGS forecasts total employment in Ripley Valley PDA to reach 11,700 jobs by 2046, and 14,200 jobs by 2066 (ultimate development). This represents 0.3 additional jobs per additional household in Ripley Valley. The majority of these jobs are expected to be population serving industries including retail, accommodation and food services, health, education and construction. SGS estimates that 22 new jobs in education and training will be created for every 1,000 new residents. While the proponent’s total land area within the RVPDA will create 287 jobs by 2066.

Ripley Valley household size will be expected to remain slightly above the QLD average household size of 2.6 persons per household and the largest amount of population growth for the area are young families aged between 30-49. With this, SGS has forecasted primary school aged children (5-11 years) living in Ripley Valley to increase by 12,400 people and secondary school aged children (12-17 years) to increase by 10,400 people to 2066. This trend clearly has implications for future school provision.

With the continuous growth in the area, it is essential to be able to establish new schools at the appropriate time to meet the demand. The provision of both primary and secondary school on this reference site will benefit not only the community but also create more employment opportunities.

In terms of estimating the economic benefit of the action - Base costs for the preparation of land for state community facilities have been created on a first principles basis, based on the required works for the standard land area identified within background planning, assuming a regular shaped block, and the median of:

- Developer unit rates for all site preparation works, provided as part of a unit rate benchmarking assessment
- Indicative site preparation works costs identified within the RLB Opinion of Cost assessment (where available)

This cost has been converted to a ‘per hectare’ rate for inclusion in the DCOP.

The included scope of works in the base costs includes:

- Clearing and grubbing
- Bulk earthworks (one metre cut to fill allowance) and grassing suitable for the site purposes
- Service connections including potable water, sewerage, telephony, broadband, stormwater, and electricity
- Service connection to non-potable water, if adjacent to a supply system
- Construction of a Neighbourhood Access Road cross section which will be one of the school road frontage, including a 2.5m wide pathway.

Additionally, the scope of works for school sites also includes:

- Provision of up to 2 bus bays
- Safety fencing in the road reserve, if required up to a length of 300m

Table A52: Extract RVPDA Infrastructure Plan Background Report Table 6.3.6.1 State Government Facilities Site Works Unit Rates

State Government Facility Embellishment Cost	
Asset Type	Rate \$/m ²
Ambulance Station	\$40.62
Fire & Rescue Station	\$40.62
Police Station	\$40.62
Health Care Centre	\$40.62
Health Precinct	\$40.62
State Primary School	\$27.69
State Secondary School	\$22.00

Note: All costs are presented in July 2022 dollars

Typical size of primary education facility is 70,000 m² and 120,000 for a secondary education facility (DSDILGP, 2022). Based on these estimates the economic benefit of the action (embellishment cost for the construction of a primary and secondary facility) will be \$4,578,300.

8.3 Stakeholder Consultation

Item 8.3 of the PD Request advises the response must ***“Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.”***

During the preparation of the RVPDA Development Scheme, EDQ consulted with Ipswich City Council, 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.

No public consultation has been undertaken specific to the project. Public consultation was sought during the development assessment process at the Local and State level, and will again be sought through this EPBC Act assessment. All public submission will be taken into account when finalising the design and operation of the project.

8.4 Indigenous Stakeholder Consultation

Item 8.4 of the PD Request advises the response must ***“Provide details of any consultation with Indigenous stakeholders.”***

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.

Advise if any indigenous heritage surveys or assessments of the area have been previously undertaken as part of earlier works. If surveys have been previously undertaken, please make these surveys or assessments available and provide a summary of findings to the department as part of the assessment documentation.

Describe any Indigenous consultation that has been undertaken, or will be undertaken, in relation to the proposed action and their outcomes. This should include:

- ***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.***
- ***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 Guidance for proponents on best practice Indigenous engagement for environmental assessments under the EPBC Act (2016) includes:

- ***identifying and acknowledging all relevant affected Indigenous peoples and communities;***
- ***committing to early engagement;***
- ***building trust through early and ongoing communication for the duration of the project, including approvals, implementation and future management;***
- ***setting appropriate timeframes for consultation; and***
- ***demonstrating cultural awareness.***

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."

Ripley Projects C/O Jolifields Development Pty Ltd, The Trustee for Morehampton Capital and the Trustee for the Goldfields QLD Trust have been in consultation with the Jagera Daran people through the services of Everick Heritage Consultants. Additionally, various levels of stakeholder engagement occurred during the assessment process for the PDA approval.

The Applicant is advised to ensure that any development obligations pursuant to the provisions of the Aboriginal Cultural Heritage Act 2003, the Sustainable Planning Act 2009 and the Sustainable Planning Regulation 2009 are complied with in respect to the proposed development. Applicants, developers and

landowners have a duty of care under the legislation where items of cultural heritage significance are located, even if those items have not been previously recorded in a database.'

The proponent has complied with obligations under the Aboriginal Cultural Heritage Act (2003) through engaging with the Endorsed Party for the site on 23 June 2017. Jagera Daran has already conducted cultural heritage surveys and undertaken mitigation previously. There are no longer any cultural heritage obligations with the site been given clearance for development activities.

Additionally, the referral will be open to public comment for the period of assessment under the EPBC Act.

9 Ecologically 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 *Environmental Protection and Biodiversity Conservation Act 1999* (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’.

The goal of the National Strategy for Ecologically Sustainable Development is:

Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.

The core objectives include:

1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
2. To provide for equity within and between generations; and
3. To protect biological diversity and maintain essential ecological processes and life-support systems

These objectives are accompanied by seven guiding principles of ESD (refer **Table A53**).

Table A53: ESD Principles

ESD Core Objectives

1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations

The project will benefit individuals and the community as a whole by providing an education facility in an area that is undergoing rapid urbanisation. The construction and operation of the action will enhance the local and regional economy and in turn the Ripley Valley area.

2. To provide for equity within and between generations

The proposed action will safeguard the needs of future generations while meeting the demands of current generations. Management measures will be implemented to mitigate potential impacts, while an offset will compensate for the residual impacts on critical habitat. This will ensure that the habitat which is lost will be recreated to achieve no net loss of critical habitat for the Koala or Grey-headed Flying-fox. The action has taken into account

ESD Core Objectives

the diverse needs of the community by providing a school in an area with a rapid population growth. This will ensure that appropriate housing is available to current and future generations.

3. To protect biological diversity and maintain essential ecological processes and life-support systems

The site has been subject to comprehensive environmental surveys and reporting. The ecological values of the site have been identified and recorded. The site is comprised entirely of remnant vegetation that is of Least Concern Regional Ecosystems and has been subject to historical clearing. Field surveys confirmed the site is not considered to have significant ecological value. Impacts are minimised by including mitigation measures such as VC&MP, FMP, Environmental Preclearance Packages and the implementation of a fauna spotter catcher during vegetation clearing.

The proposed action will result in the loss (direct and functional) of approximately 19.1 ha of habitat critical to the survival of the Koala and potential Grey-headed Flying-fox foraging habitat. All vegetation clearing under the proposal will be government by DESI requirements for fauna management and any significant residual impacts are to be compensated through land-based offsets.

ESD Guiding Principles

1. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations

The design of the proposed action has taken both long-term and short-term economic, environmental, social and equitable considerations into account. High level regional planning was considered when the Ripley Valley was strategically declared a PDA by the State Government. The urban designation has taken into account the proximity of existing and future infrastructure which provides efficient transport routes for community members. In addition, the proposed action site is in proximity to existing residential development and adjoins the approved Ripley Road Residential development (EPBC 2017/8905) which will provide residential, development.

The proposed school will not only provide an education facility in an area undergoing rapid urbanisation, but also provide jobs and social benefits from a sense of community.

2. 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 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 site's utilisation by Koalas and its ability to provide critical habitat have

ESD Core Objectives

been discussed in detail throughout this document. The site has been recognised to support low level Koala activity (refer **Section 3.3.3.1**). In total, the proposed action will result in the direct loss of 19.1 hectares of habitat critical to the survival of the Koala, resulting in a quantum impact of 11.46 hectares (MHQA score of 7).

A number of direct and indirect impacts have been identified as a result of the proposed action (refer **Section 4.6**). The magnitude of impact is considered to be restricted to the referral area. Impacts can be summarised as those arising from the loss of habitat, barriers to movement and injury or death from vehicle strike. A number of management measures will be imposed to avoid and mitigate these impacts as detailed within **Section 5.2**. The identified impacts are considered mostly to be manageable through the implementation of management plans, and through increase community awareness of wildlife.

The referral area is not considered to support a Koala metapopulation and no Grey-headed Flying-fox roosts were identified during field surveys. As such, proposed action is not considered to pose a threat of serious or irreversible damage to MNES 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.

3. The global dimension of environmental impacts of actions and policies should be recognised and considered.

The proposed action is not considered to have a global impact, however, it is recognised that the principles of ESD are enshrined within many international treaties and national policies. The proposed action demonstrates ESD by taking into account environmental, social and economic considerations in the decision making process. The purpose of relevant international agreements on ESD is to promote the consideration of ESD principles for a variety of actions at all levels across the globe. By taking ESD into account, this project has satisfied global objectives. The overall global environmental impact however will be extremely minimal.

4. The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.

The relationship between economic development and environmental protection has been continuously identified within international agreements and national policies. In particular, the Kuznets Curve shows a link between economic development and environmental protection, whereby once a society reaches a particular level of development, it starts to recognise and invest in environmental conservation.

Economic development and prosperity allows for a greater financial resource base to be dedicated to conservation outcomes. This can be demonstrated at global, national and localised scales. Individual landholders are not generally in a position to be undertaking significant rehabilitation projects on their land. This project presents an important opportunity to consolidate areas of significance external to the RVPDA and protect land located within the Flinders-Karawatha Bioregional Corridor through offsets. The offsets will be secured through the financial backing brought by the proposed action will create a large funding pool. While the proposed offsets are at a local scale, it will increase connectivity within the wider landscape by augmenting the Flinders-Karawatha Corridor and provide an important conservation function by increasing the availability of large, connected areas of habitat free of threats caused by weeds, fences, dogs and vehicles.

5. The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.

ESD Core Objectives

The proposed action will not cause significant residual adverse impacts to the environment. This project will increase education facilities in an area that is undergoing rapid urbanisation. Further, the site is located within the RVPDA which has been strategically planned for urban growth.

6. Cost effective and flexible policy instrument should be adopted, such as improved valuation, pricing and incentive mechanisms.

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

7. Decisions and actions should provide for broad community involvement on issues which affect them.

As part of the development application process for a Material Change of Use, the proponents were required to engage in public consultation which involved the notification of the proposed action to seek public comment. The proponent was found to satisfy all public notification requirements applicable under the RVPDA Development Scheme, which guides public notification requirements in the development area. Any public submissions were taken into account during the final decision-making process and incorporated into conditions set by EDQ. Additionally, this preliminary documentation will be made available for public comment during the notifications stage of the EPBC Act assessment process. Again, any submissions by the community will be taken into account in the final design of the proposed action. Further information detailing public consultation is provided in **Section 7.3**.

10 Environmental record

This section responds to Item 10 of the PD Request which asks the proponent to, ***“Include details of any adverse findings 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, and

b) For an action for which a person has applied for a permit, the person making the application;”

Not Applicable. Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust is not currently nor has historically been involved in proceedings under Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

11 Conclusion

The *Environmental Management Division* of Saunders Havill Group act on behalf of Jolifields Development Pty Ltd & The Trustee for Morehampton Capital & Trustee for the Goldfields QLD Trust in the coordination and production of the response to *Environment Protection and Biodiversity Conservation Act* (EPBC Act) 'Controlled Action' Assessment (2021/9070) for the Hayfield School Site located at Fischer Road, Ripley, within the Ripley Valley Priority Development Area.

The referral under the EPBC Act was made to the then Commonwealth Department of the Environment for 'Controlled Action' assessment. On 25 November 2021, this application was deemed a 'Controlled Action' requiring assessment by 'Preliminary Documentation'. The 'Controlled Action' decision was based on the following:

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

This 'Preliminary Documentation' Report provides information requested by the Department to assist the assessment manager in determining whether or not the proposed action should be approved.

Desktop assessments determined only two (2) MNES were considered as having a moderate likelihood of occurrence on or adjacent to the referral area; the Koala and Grey-headed Flying-Fox. Although no Koalas were observed within the referral area, evidence of use was recorded in the form of scats. However, recent SAT surveys conducted in conjunction with the MHQA determined the referral area supported low activity levels. The Grey-headed Flying-fox was not recorded during field surveys nor was a roost identified within the referral area, with the nearest active camp being located approximately 3.28 km to the west.

The referral documentation (**Part B**) determined that all other MNES including the Greater Glider, Swift Parrot, and Regent Honeyeater were a low likelihood of occurrence based on desktop analysis, however, remained a target throughout the survey period. Despite comprehensive field surveys, these species were not detected on or adjacent the referral area. Updated Significant Impact Assessments were completed for these species after additional documentations were released between the referral and this version of the PD. As such, the proposed action is not considered to have a residual significant impact on these species.

Field surveys confirmed evidence of the Koala and considered likely to provide Grey-headed Flying-fox foraging habitat within the referral area. The proposed action will result in the clearing of vegetation identified by the Department as habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox.

An offset will be delivered in accordance with the *EPBC Act Environmental Offsets Policy 2012* to compensate for the unavoidable loss of 19.1 ha of habitat critical to the survival of the Koala and potential foraging habitat for the Grey-headed Flying-fox.

12 References

Austecology (2014). Koala Survey and Habitat Assessments, Lot 3 SP237241, 352 Ripley Road, Ripley. Report prepared for Nu-Vision Pty Ltd.

Blickley, Jessica L. and Patricelli, Gail L. (2010) 'Impacts of Anthropogenic Noise on Wildlife: Research Priorities for the Development of Standards and Mitigation', *Journal of International Wildlife Law & Policy*, 13: 4, 274 — 292

Bradley Law, Chris Slade, Leroy Gonsalves, Traecey Brassil, Cheyne Flanagan, Isobel Kerr (2022). Tree use by koalas after timber harvesting in a mosaic landscape. *Wildlife Research*, 50(7), 581-592

Briscoe, N. J., et al. (2014). Tree-hugging koalas demonstrate a novel thermoregulatory mechanism. *Biology Letters*, 10(6).

Callaghan, J and Rhodes, J (2005). Koala Beach Estate Monitoring Program. Prepared for the Ray Group by the Australian Koala Foundation.

Cork, S. and Braithwaite, L. (1996). Resource availability, eucalypt chemical defenses, and habitat quality for leaf-eating marsupials, Koalas: research for management, World Koala Research, Brisbane, Queensland.

Cork, S. and Sanson, G. (1990). Digestion and nutrition in the Koala: a review, *Biology of the Koala*, Surrey Beatty & Sons, Sydney.

Department for Environment and Water (2021). National Recovery Plan for the Grey-headed Flying-fox (*Pteropus poliocephalus*) <https://www.environment.gov.au/system/files/resources/d5c36659-4732-47a2-bab7-d3c3f711693a/files/recovery-plan-grey-headed-flying-fox.pdf>

Department of Climate Change, Energy, the Environment and Water (2022). Grey-Headed Flying-fox (*Pteropus poliocephalus*) in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>.

Department of Climate Change, Energy, the Environment and Water (2022). Koala (*Phascolarctos cinereus*) in Species Profile and Threats Database, Commonwealth Government, Canberra. Available from: <http://www.environment.gov.au/sprat>.

Department of Environment and Heritage Protection (EHP) (2012). State Government Supported Infrastructure, Koala Conservation Policy (July 2014), EHP, Brisbane.

Department of Environment and Heritage Protection (EHP) (2017). Guide to determining terrestrial habitat quality, A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy Version 1.2 State of Queensland, 2014.

Department of Environment and Resource Management (DERM) (2009). Decline of the Koala Coast Koala Population: Population status in 2008. Department of Environment and Resource Management, Queensland.

Department of Environment and Resource Management (DERM) (2010). Koala Coast Koala Population Report 2010. Prepared by the Queensland Department of Environment and Resource Management.
Department of Infrastructure and Planning (DIP) (2009). South East Queensland Regional Plan 2009-2031, prepared by the Honourable Stirling Hinchliffe in consultation with the South East Queensland Regional Coordination Committee.

Department of Infrastructure, Local Government and Planning (DILGP) (2017). ShapingSEQ – South East Queensland Regional Plan 2017, The State of Queensland, Brisbane.

Department of Infrastructure, Local Government and Planning (DILGP) (2017). South East Queensland Regional Plan 2017 (ShapingSEQ). <https://dilgprrd.blob.core.windows.net/general/shapingseq.pdf>

Department of the Environment (2014). EPBC Act Referral Guidelines for the Vulnerable Koala. <http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-vulnerable-koala>

Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) (2022). Ripley Valley Development Charges and Offsets Plan (DCOP). https://www.statedevelopment.qld.gov.au/_data/assets/pdf_file/0020/72902/ripley-valley-dcop-july-2022.pdf

Dique, DS, Preece, HJ, Thompson, J and de Villiers DL (2004). Determining the distribution and abundance of a regional Koala population in south-east Queensland for conservation management. Wildlife Research 31: 109-117.

Ellis WAH, Melzer A, Carrick FN, Hasegawa M. (2002) Tree use, diet and home range of the koala (*Phascolarctos cinereus*) at Blair Athol, central Queensland. Wildlife Research 29, 303–311.

Eyre, T.J., Kelly, A.L, Neldner, V.J., Wilson, B.A., Ferguson, D.J., Laidlaw, M.J. and Franks, A.J. (2015). BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual. Version 2.2. Queensland Herbarium, Department of Science, Information Technology, Innovation and Arts, Brisbane.

Harwood, S.E., Whisson, D.A. (2025). Bellowing for habitat on private land: distribution of koalas in a complex landscape. Landsc Ecol 40, 190. <https://doi.org/10.1007/s10980-025-02183-0>

JW&A (2012). Constraints Analysis Report Lot 3 on SP237241 Ripley Road Ripley. Report prepared by James Warren & Associates Pty Ltd for the Urban Land Development Authority

Kavanagh, R. P., et al. (2007). Koalas and habitat quality in New South Wales. *Conservation Biology*, 21, 792–804.

Melzer, A., Carrick, F., Menkhorst, P., Lunney, D. and John, B.S. (2000). Overview, Critical Assessment, and Conservation Implications of Koala Distribution and Abundance. *Conservation Biology*, 14: 619-628.

Mitchell, D.L.; Soto-Berelov, M.; Jones, S.D. (2021). Regional Variation in Forest Canopy Height and Implications for Koala (*Phascolarctos cinereus*) Habitat Mapping and Forest Management. *Forests* 2021, 12, 1494

McAlpine, C. A., Rhodes, J. R., Callaghan, J. G., Bowen, M. E., Lunney, D., Mitchell, D. L., Pullar, D. V., and Possingham, H. P. (2006). The importance of forest area and configuration relative to local habitat factors for conserving forest mammals: A case study of koalas in Queensland, Australia. *Biological Conservation*, 132: 153-165

McAlpine, C.A., Callaghan, J., Lunney, D., Rhodes, J.R., Goldingay, R., Goulding, W. et al. (2023). Influences on koala habitat selection across four local government areas on the far north coast of NSW. *Austral Ecology*, 48, 928–951.

Moore, B. D., and W. J. Foley. (2000). A review of feeding and diet selection in Koalas (*Phascolarctos cinereus*). *Australian Journal of Zoology* 48:317-333

Moore, B. D., and W. J. Foley. (2005). Tree use by Koalas in a chemically complex landscape. *Nature* 435:488-490.

Neldner, V.J., Wilson, B.A., Dillewaard, H.A., Ryan, T.S., Butler, D.W., McDonald, W.J.F, Richter, D., Addicott, E.P. and Appelman, C.N. (2023) Methodology for survey and mapping of regional ecosystems and vegetation communities in Queensland. Version 7.0. Updated December 2023. Queensland Herbarium, Queensland Department of Environment, Science and Innovation, Brisbane.

NSW Department of Planning and Environment (2022). Koala habitat restoration guidelines: A practical guide to identify, connect and restore koala habitat in New South Wales. NSW Department of Planning and Environment – Environment, Energy and Science, Sydney, NSW.

Pahl, L. (1993). Joint Regional Koala Habitat Project - Final Report. Unpublished report, University of Queensland, Gatton.

Phillips, S. and Callaghan, J. 2000. Tree species preferences of a Koala (*Phascolarctos cinereus*) population in the Campbelltown area south-west of Sydney, New South Wales. *Wildlife Research* 27: 569–75.

Phillips, S. and Callaghan, J. 2011. The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas *Phascolarctos cinereus*. *Australian Zoologist* 35: 774-80.

Phillips, S., Callaghan, J. and Thompson, V. 2000. The tree species preferences of Koalas (*Phascolarctos cinereus*) inhabiting forest and woodland communities on Quaternary deposits in the Port Stephens area, New South Wales. *Wildlife Research* 27: 1–10

Polkinghorne, A., Hanger, J., & Timms, P. (2013). *Chlamydia pecorum*: Pathogenesis, epidemiology and control of infection in koalas. *Pathogens and Disease*, 67, 1–15.

QEPA (2006) *Wildlife Online*: an online wildlife database. Queensland Government Environmental Protection Agency.

Queensland Government. (2018). *Koala Expert Panel Report: Protecting Queensland's Koalas*.

Rhodes JR, Chooi, FN; deVilliers, DL, Preece, HJ, McAlpine, CA and Possingham, HP, (2011). Using integrated population modelling to quantify the implications of multiple threatening processes for a rapidly declining population. *Biological Conservation* 144 (3): 1081-1088.

Rhodes, J. R., Wiegand, T., McAlpine, C.A., Callaghan, J., Lunney, D., Bowen, M., and Possingham, H.P. (2006). Modelling Species' Distributions to Improve Conservation in Semiurban Landscapes: Koala Case Study. *Conservation Biology*, 20: 449-459.

Rus, A.I., McArthur, C., Mella, V.S.A. and Crowther, M.S. (2021), Habitat fragmentation affects movement and space use of a specialist folivore, the koala. *Animal Conservation*, 24: 26-37.

Ryan, T.S. (2019). *Technical Descriptions of Regional Ecosystems of Southeast Queensland*, (Queensland Herbarium, Department of Science, Information Technology, Innovation and the Arts: Brisbane).

Saunders, D.L. and Tzaros, C.L. (2011). *National Recovery Plan for the Swift Parrot Lathamus discolor*, Birds Australia, Melbourne.

SHG (2017). *Technical Ecological Report*, Ripley Road, Ripley. Prepared for Ripley Projects Pty Ltd C/O Goldfields Northern Pty Ltd.

Tarlinton, R., Meers, J., Hanger, J., & Young, P. (2013). Koala retrovirus: A review of its virology, epidemiology and host impact. *Journal of Virology*, 87, 6358–6365.

Whisson DA, Rivera P, Rendall AR (2023) Systematic acoustic surveys inform priority conservation areas for koalas in a modified landscape. *Landsc Ecol* 38:1279–1290

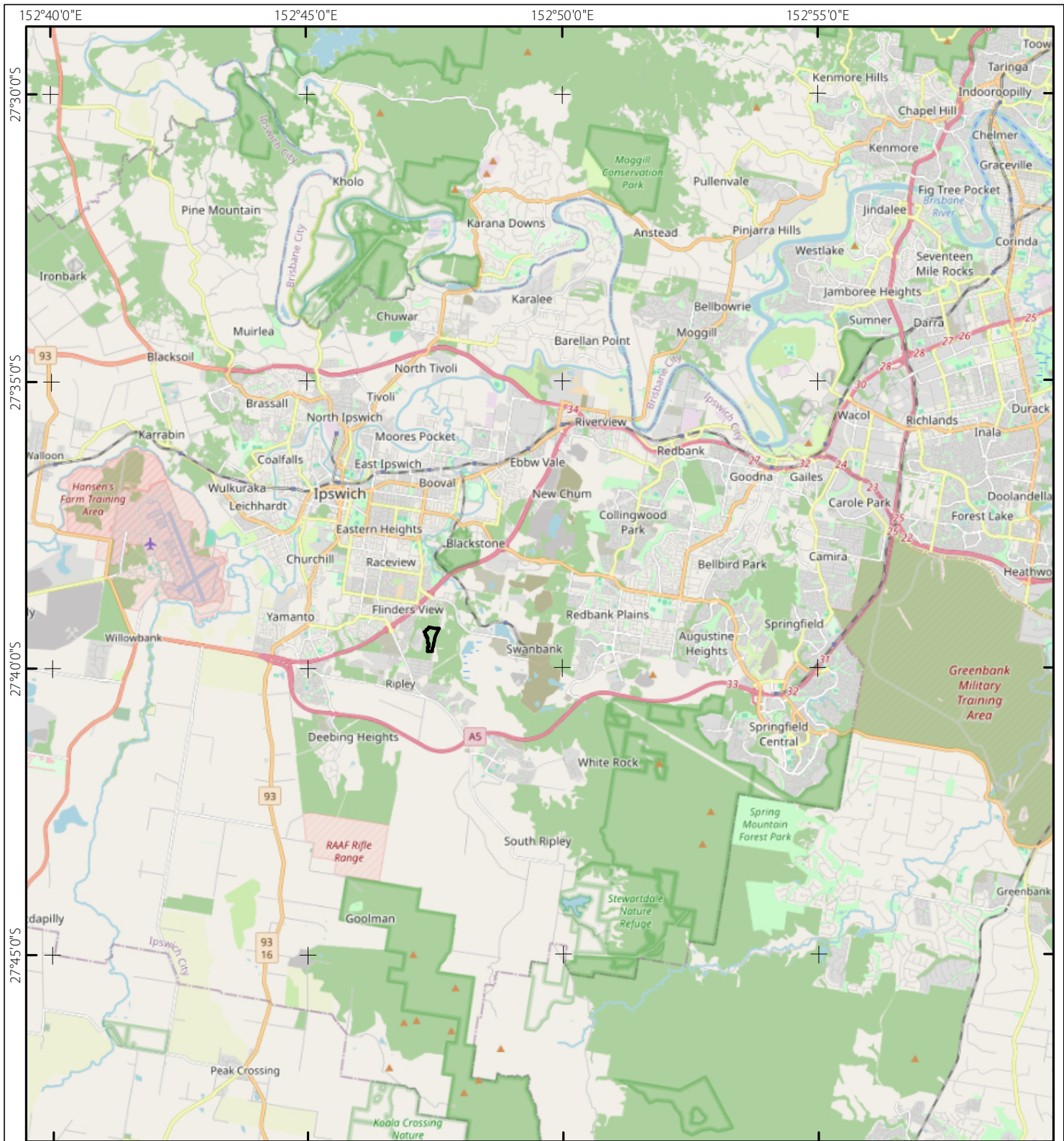
White, N. A. (1999) 'Ecology of the Koala (*Phascolarctos cinereus*) in rural south east Queensland, Australia' *Wildlife Research* 26: 731–744.

Yurrah (2014). *Ecological Review*, Ecological issues review relevant to a Material Change of Use, Ripley Road, Ripley. Prepared for Nu-Vision Pty Ltd.

Yurrah (2014). Preliminary Site Review for Matters of National Environmental Significance under the EPBC Act. Report prepared for Kerdic Home Pty Ltd.

Youngentob, K.N, Marsh, K.F., Skewes, J., A. (2021) review of koala habitat assessment criteria and methods, report prepared for the Department of Agriculture, Water and the Environment.

13 Figures & Plans



Legend

 Impact Site

Figure A1
Site Context

File ref. 10835 E Figure A1 Impact Site Context B
Date 15/07/2024
Project School Site, Ripley Road, Ripley

0 1 2 3 4 5 km

Scale (A4): 1:175,000 [GDA 2020 MGA Z56]



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Legend

- Qld DCDB
- Impact Site

Figure A2

Site Aerial

File ref. 10835 E Figure A2 Impact Site Aerial B
Date 15/07/2024
Project School Site, Ripley Road, Ripley

0 100 200 m

Scale (A4): 1:5,000 [GDA 2020 MGA Z56]



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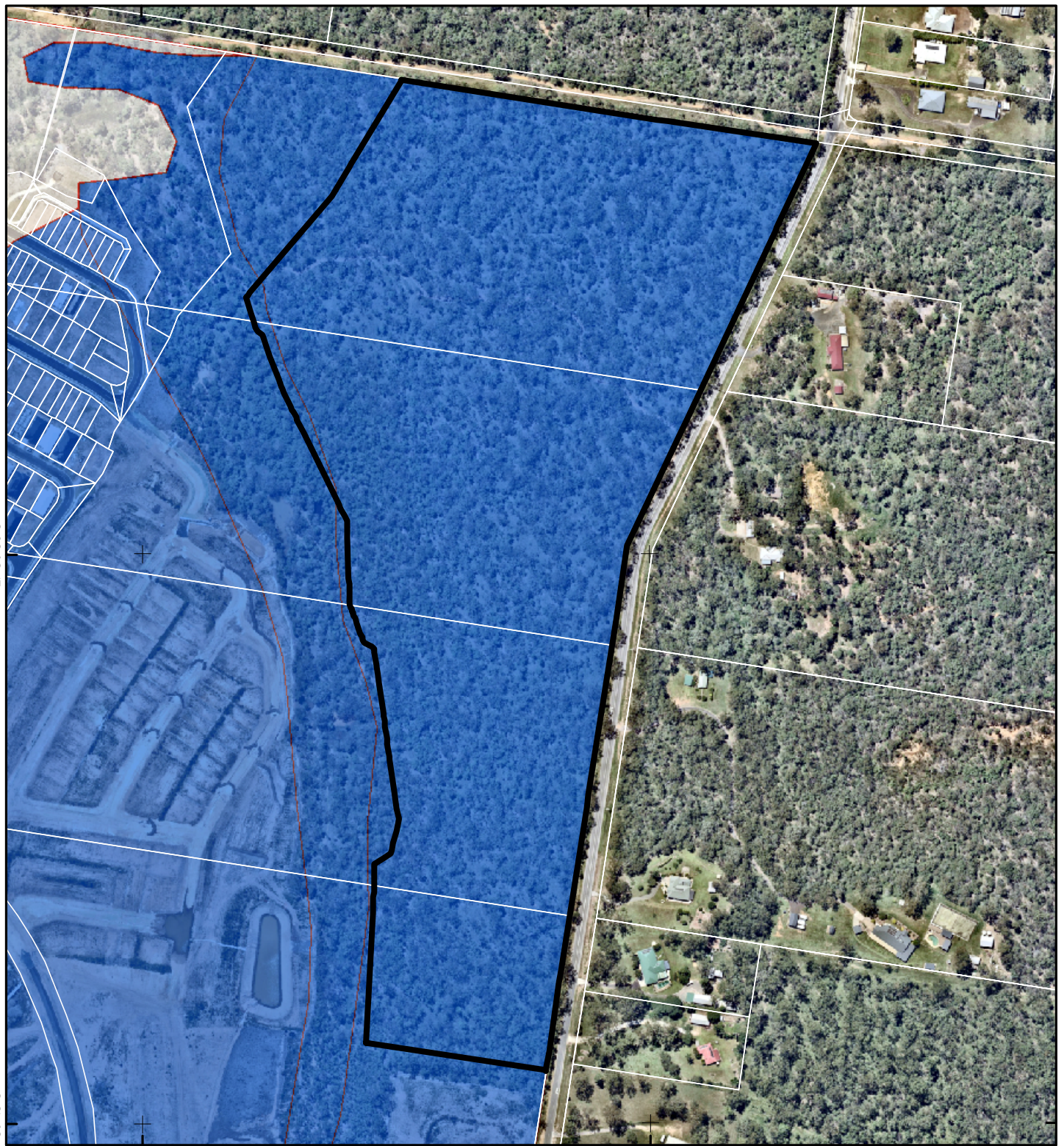
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152°47'15"E

152°47'30"E

27°39'30"S

27°39'45"S



Legend

 Qld DCDB

 Impact Site

PMAV Categories

 Category B (remnant)

 Category X (non-remnant)

Figure A3

Property Maps Assessable Vegetation

File ref. 10835 E Figure A3 Impact PMAV B

Date 15/07/2024

Project School Site, Ripley Road, Ripley

0 20 40 60 80 100 m

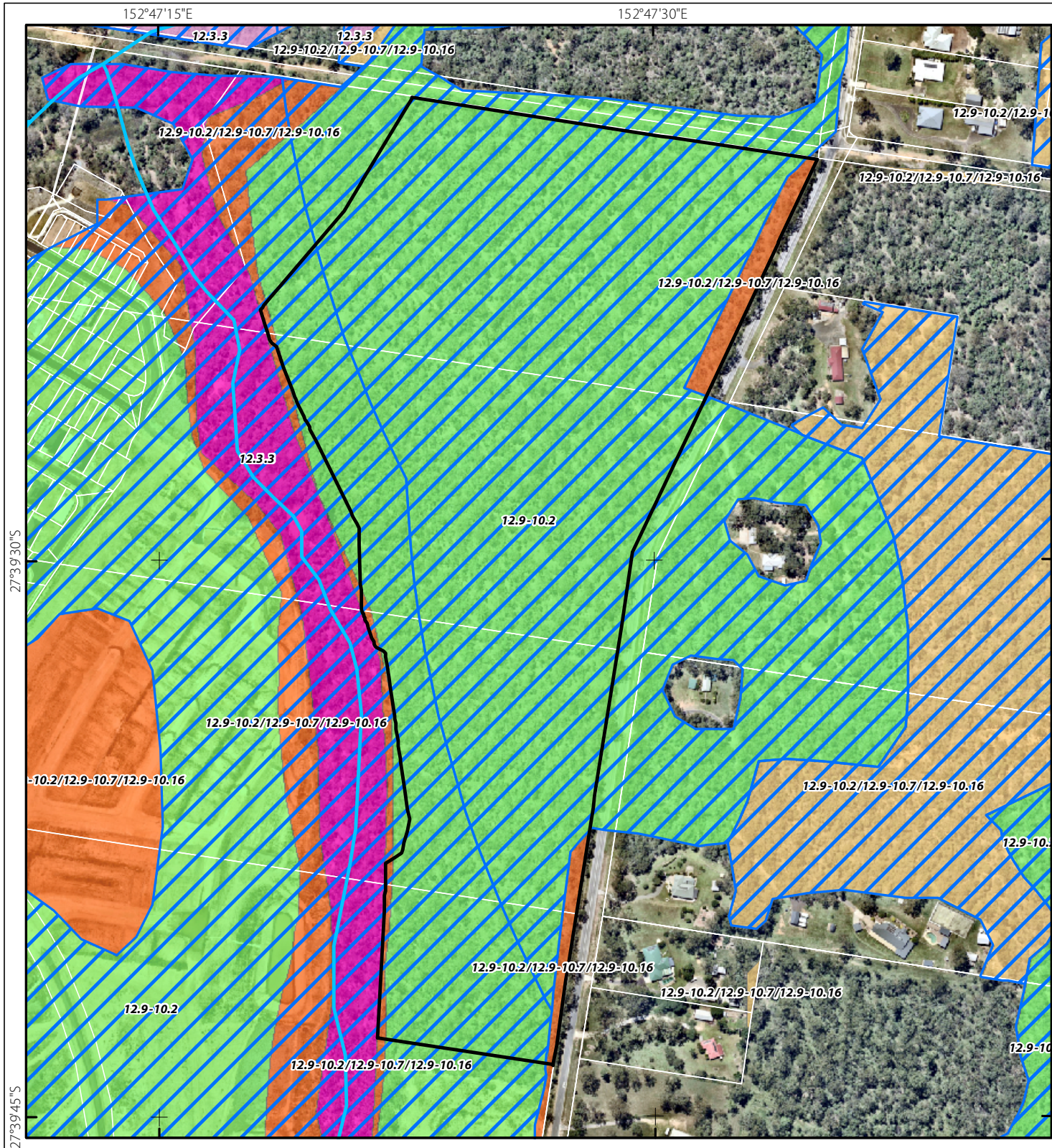
Scale (A4): 1:4,500 [GDA 2020 MGA Z56]



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Legend

	Qld DCDB	Regional Ecosystems mapping	
	Impact Site		Category A or B area containing endangered regional ecosystems
	VM Watercourses		Category A or B area containing of concern regional ecosystems
	VM Essential Habitat		Category A or B area that is a least concern regional ecosystem
	VM Wetland		Category C area containing endangered regional ecosystems
			Category C area containing of concern regional ecosystems

Figure A4

Regulated Vegetation Supporting Map

File ref. 10835 E Figure A4 Impact RVSM B
Date 15/07/2024
Project School Site, Ripley Road, Ripley

0 20 40 60 80 100 m

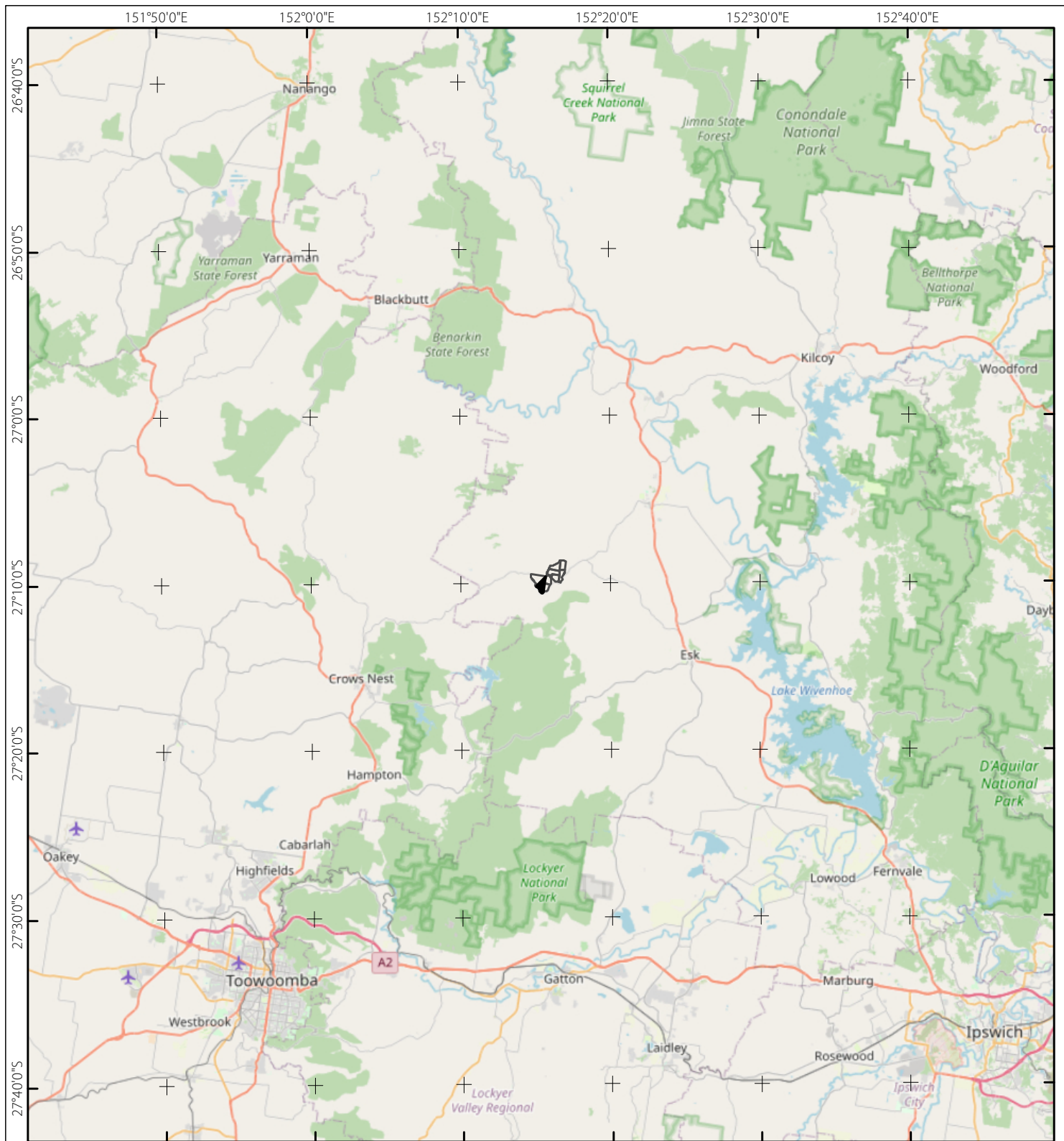
Scale (A4): 1:4,500 [GDA 2020 MGA Z56]



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Legend

- Offset site DCDB
- Offset area

Figure A5

Offset Site - Site Context

File ref. 10835 E Figure A5 Offset Site Context B

Date 4/12/2025

Project School Site, Ripley Road, Ripley

0 2 4 6 8 10 12 14 16 18 20 km

Scale (A4): 1:600,000 [GDA 2020 MGA Z56]



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Legend

- Qld DCDB
- Offset Site DCDB
- Offset Area

Figure A6

Offset Area
Site Aerial

File ref. 10835 E Figure A6 Offset Site Aerial B
Date 4/12/2025
Project School Site, Ripley Road, Ripley

0 200 400 600 800 m

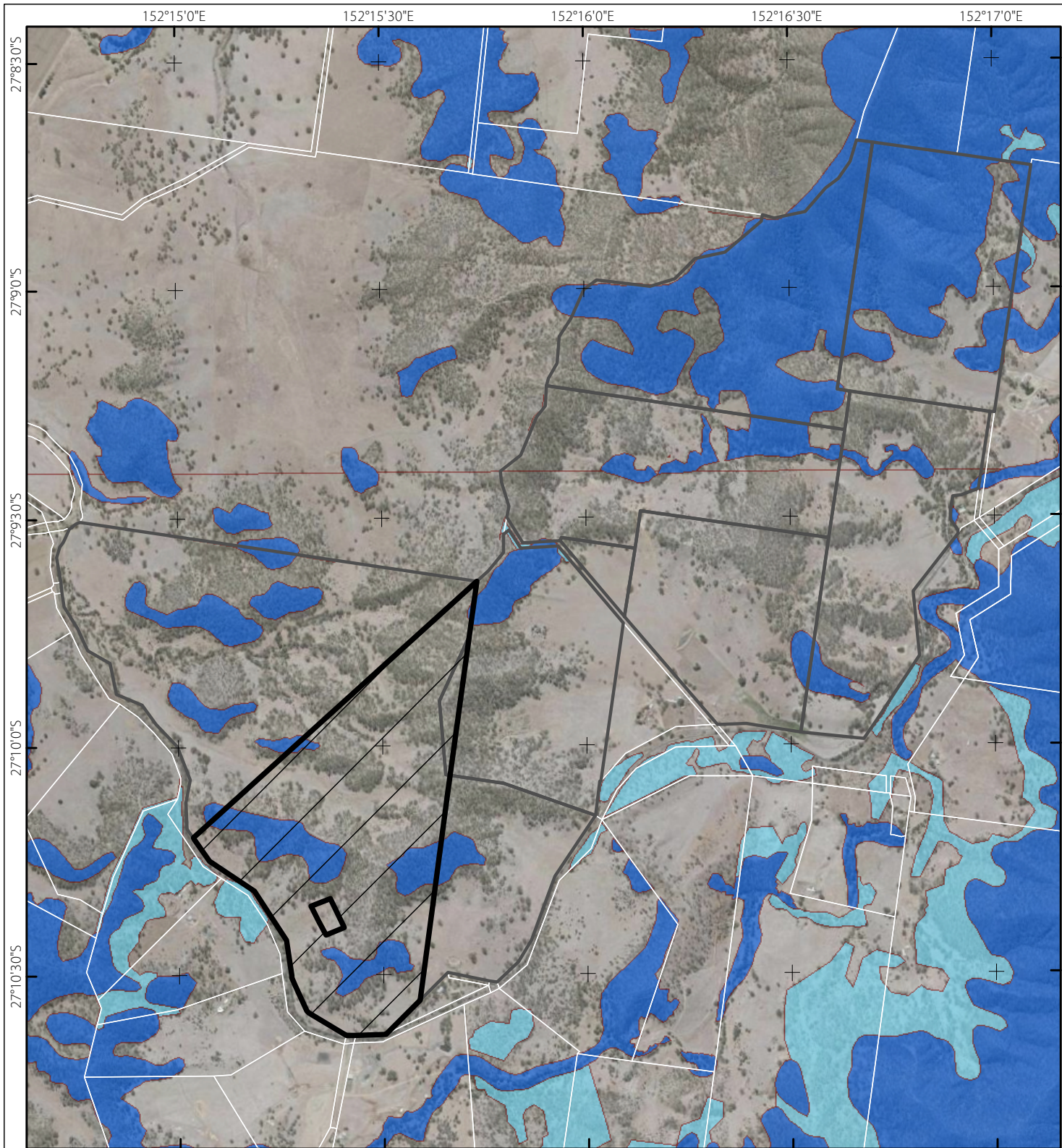
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Legend

-  Qld DCDB
-  Offset site DCDB
-  Offset Area

Regulated Vegetation

-  Category A area - Vegetation Offset/Compliance notices/VDecs
-  Category B area - Remnant vegetation
-  Category C area - High value regrowth vegetation
-  Category X area - Vegetation not regulated under the VMA

Figure A7

Offset Area Regulated Vegetation Management Map

File ref. 10835 E Figure A7 Offset Site RVM B
Date 4/12/2025
Project School Site, Ripley Road, Ripley

0 200 400 600 m

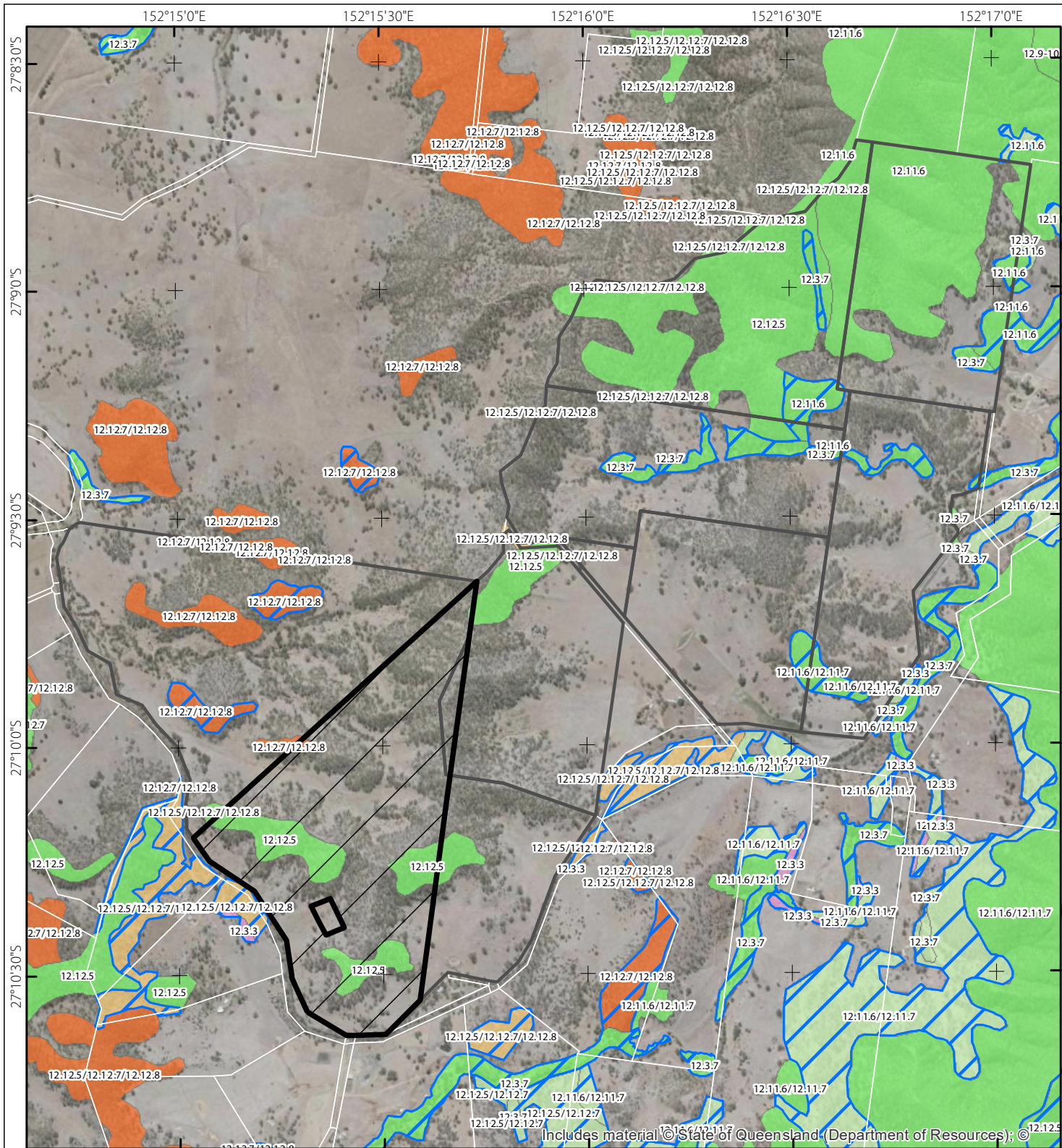
Scale (A4): 1:22,125 [GDA 2020 MGA Z56]



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Legend

	Qld DCDB	Vegetation Management Regional Ecosystems
	Offset site DCDB	Category A or B area containing of concern regional ecosystems
	Offset Area	Category A or B area that is a least concern regional ecosystem
	VM Essential Habitat	Category C area containing endangered regional ecosystems
		Category C area containing of concern regional ecosystems
		Category C area that is a least concern regional ecosystem

Figure A8

Offset Area Vegetation Management Regional Ecosystem Map

File ref. 10835 E Figure A8 Offset Site VMRE B
Date 4/12/2025
Project School Site, Ripley Road, Ripley

0 200 400 600 m

Scale (A4): 1:22,125 [GDA 2020 MGA Z56]

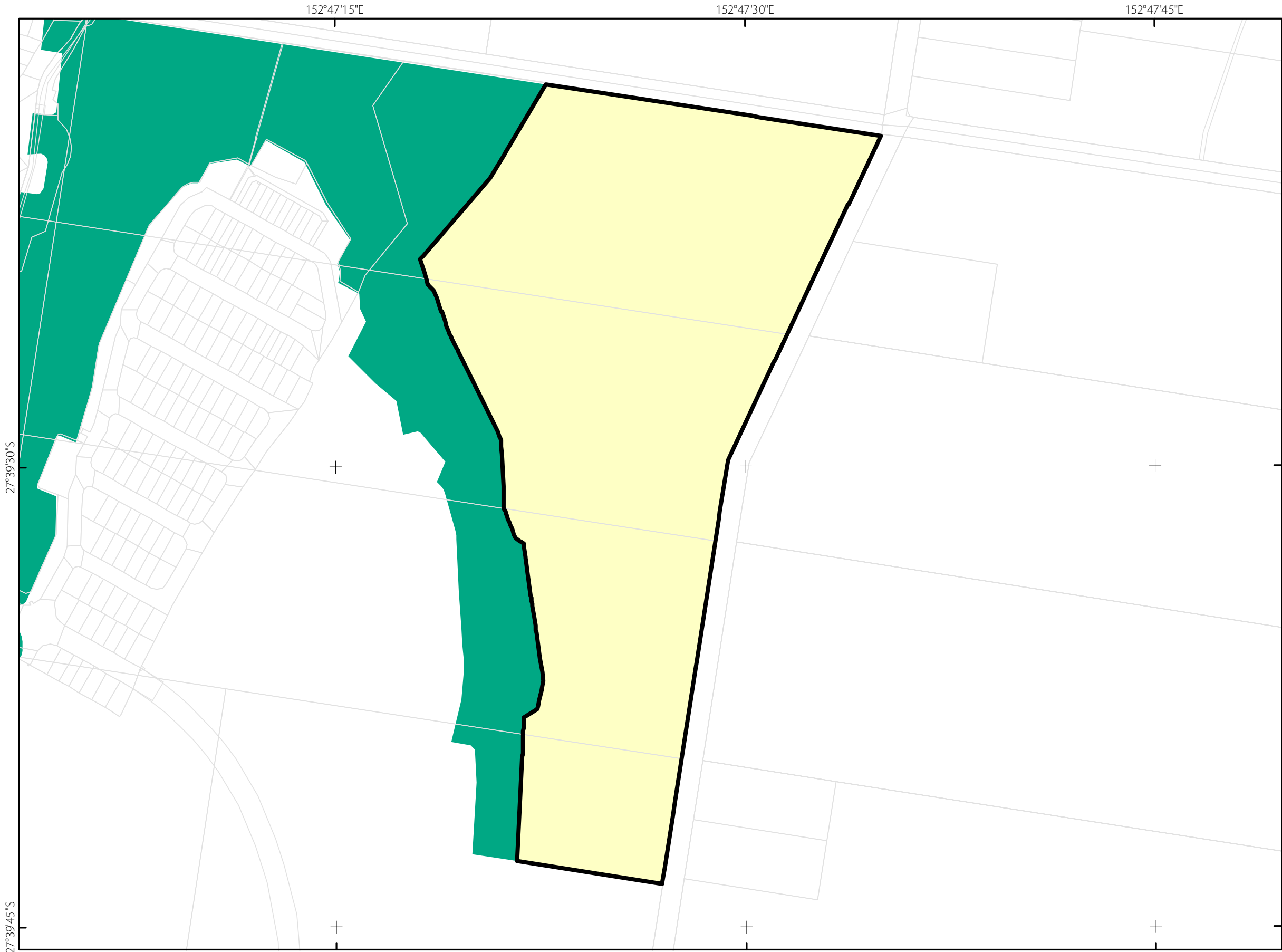


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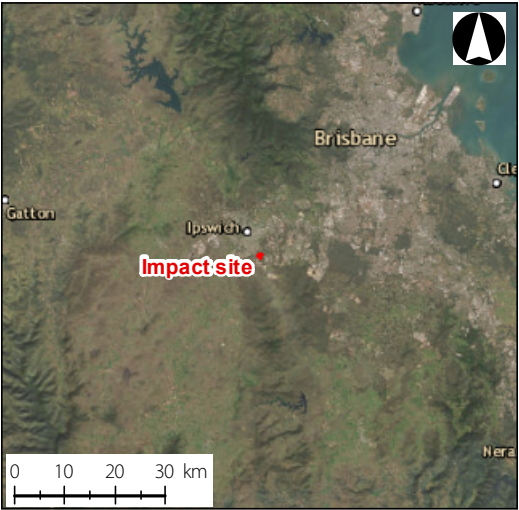
A1. Impact Site Development Footprint



Notes:
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Legend

- Qld DCDB
- Impact Site
- PDA Zoning**
 - Community Use (Education Zone)
 - Linear Open Space and Ecological Corridor Zone



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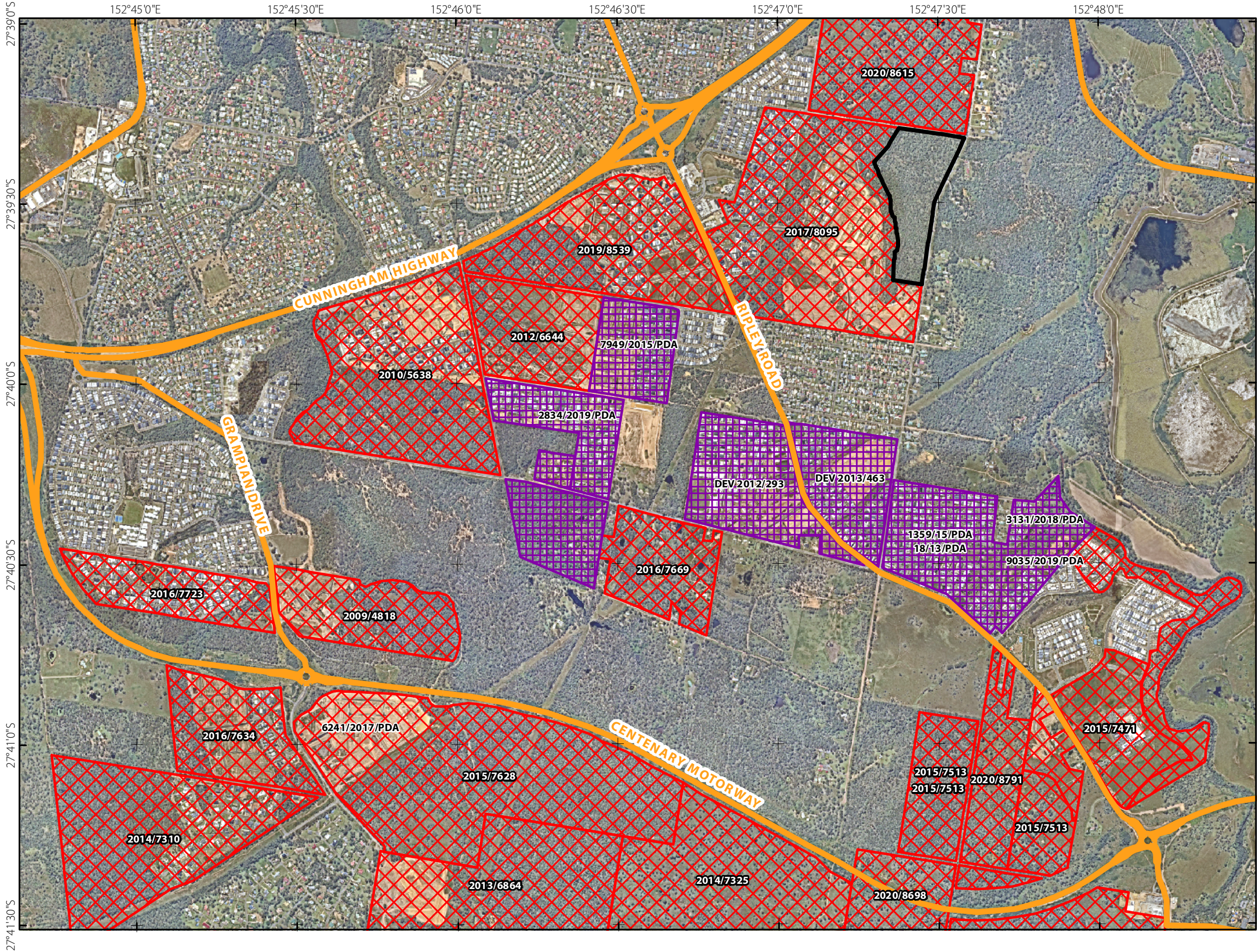
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Transverse Mercator
GDA 2020 | Zone 56

1:4,000
@ A3

Address: RPD: 901SP317868
10835 E A1 Development Footprint B

Issue	Date	Drawn	Checked
B	15/07/2024	TC	AD

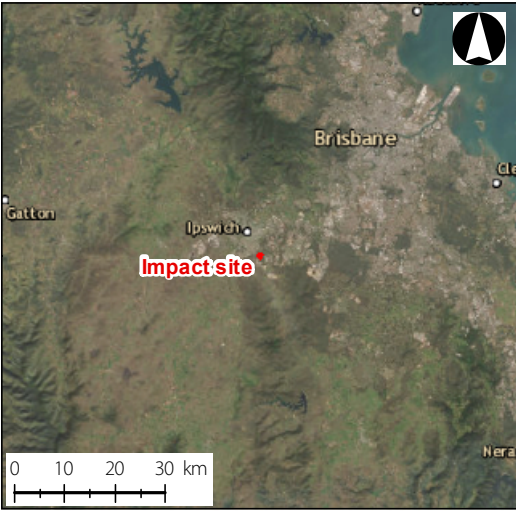
A2. Impact Site Fragmentation Analysis



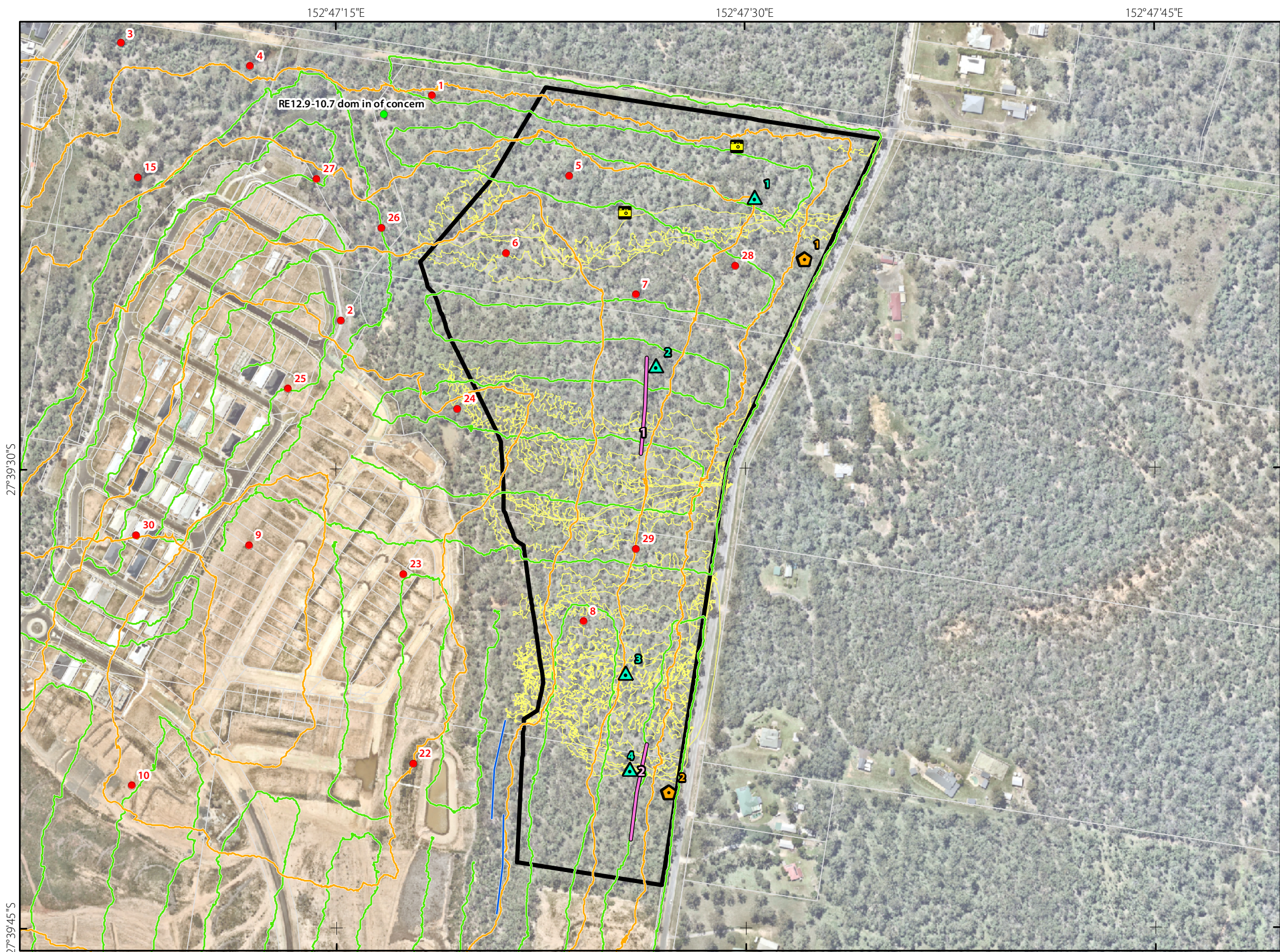
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- Legend
- Impact Site
 - Major Roads
 - Future rail corridor (indicative)
 - EDQ DA Approved Sites
 - EPBC Approvals / 'NCA' determinations



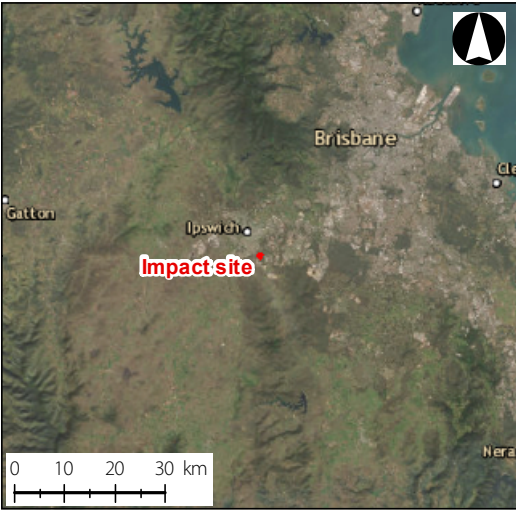
A3. Field Survey Effort



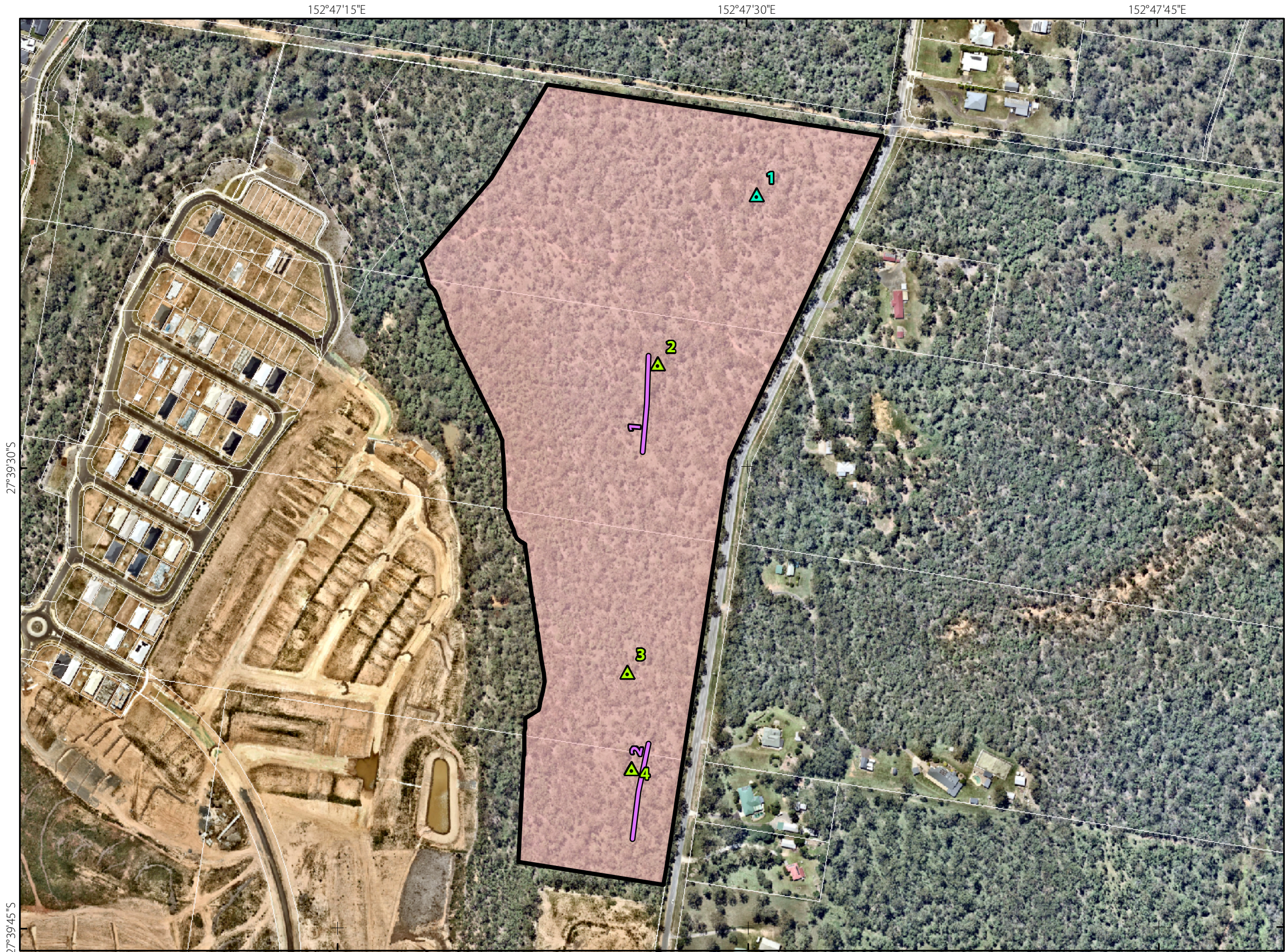
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- Legend
- Impact Site
 - Qld DCDB
 - 2022 Field Work**
 - Quaternary Survey
 - SAT Survey (2022)
 - Habitat Quality Transect
 - Fauna Camera Locations
 - 2021 Field Work**
 - NCA Meander
 - 2021 NCA
 - Habitat Transects
 - Regional Ecosystem Extents
 - SAT Survey (2014) – Austecology
 - 2024 survey tracklog**



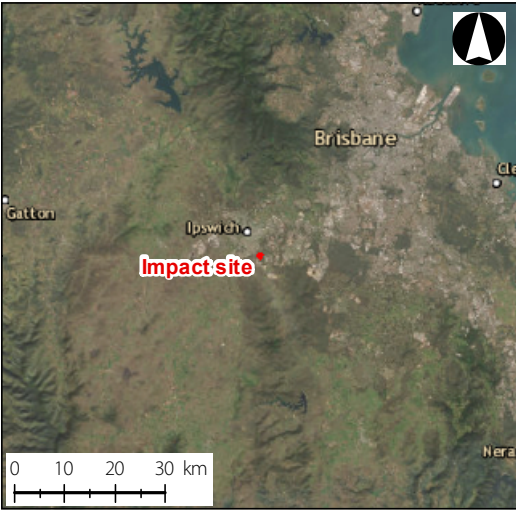
A4. Modified Habitat Quality Assessment



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- Legend
- Qld DCDB
 - Impact Site
 - Assessment Unit 1 - Remnant RE 12.9-10.2
 - Habitat Quality Transect
 - SAT Survey (2022) Results - Low
 - SAT Survey (2022) Results - Nil



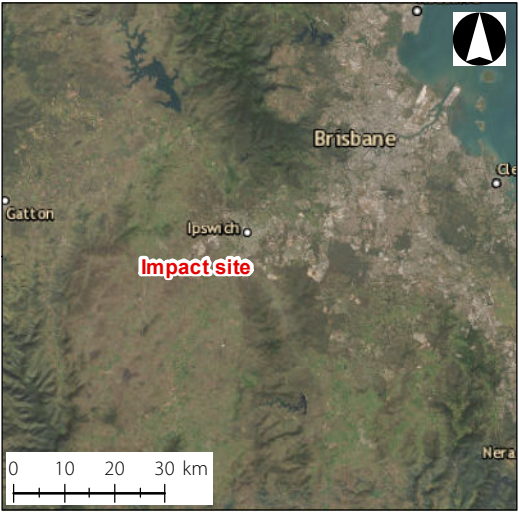
A5. MHQA Context Assessment



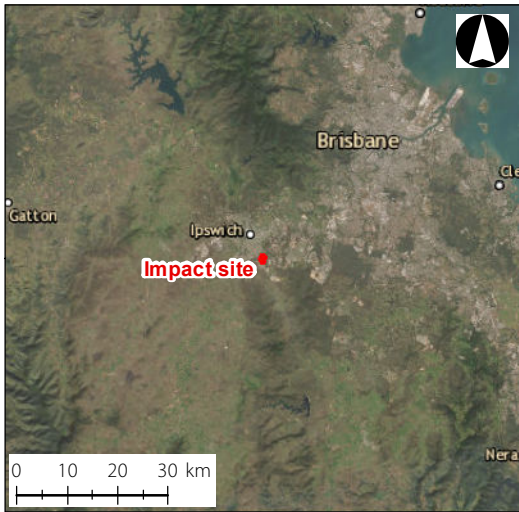
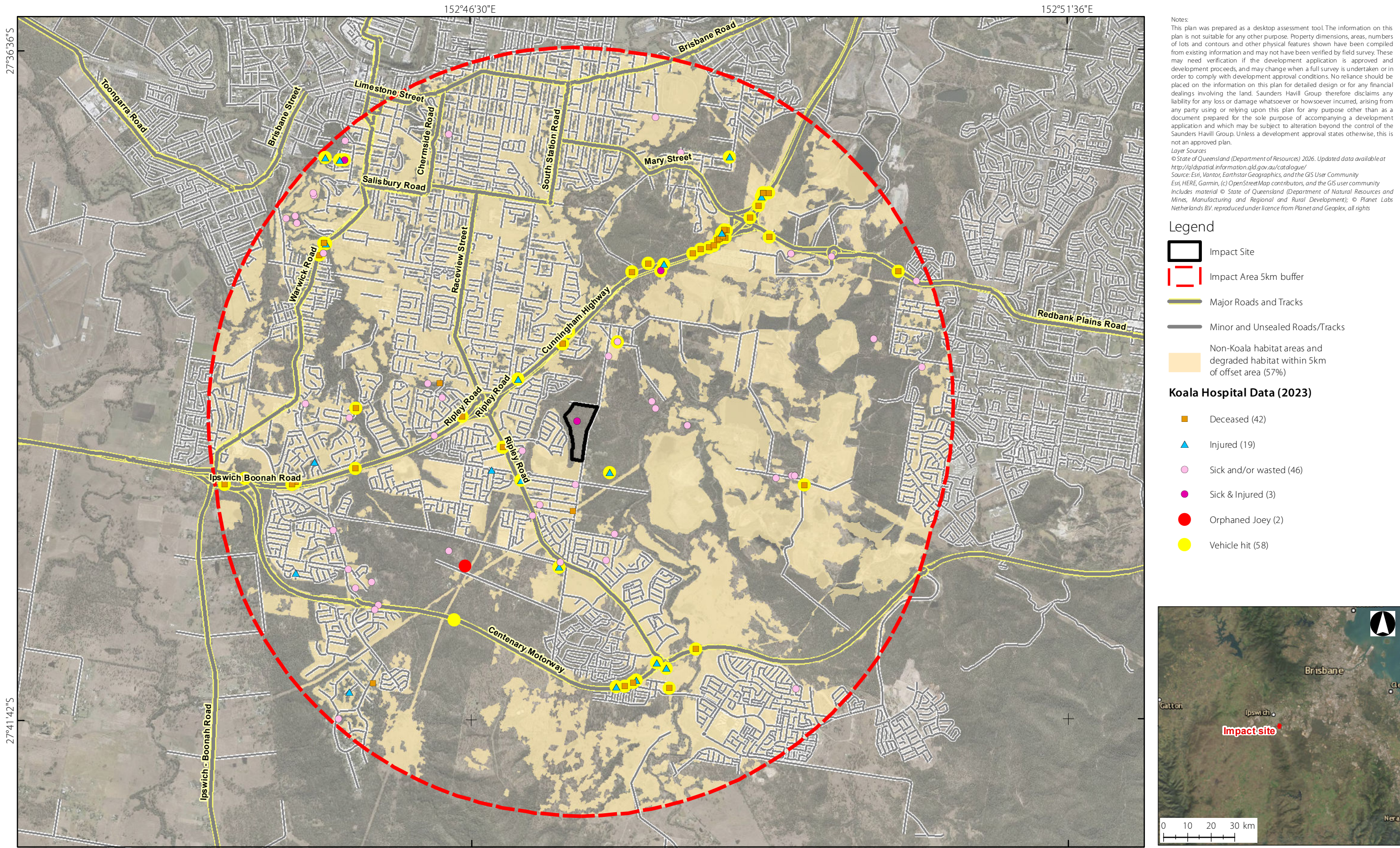
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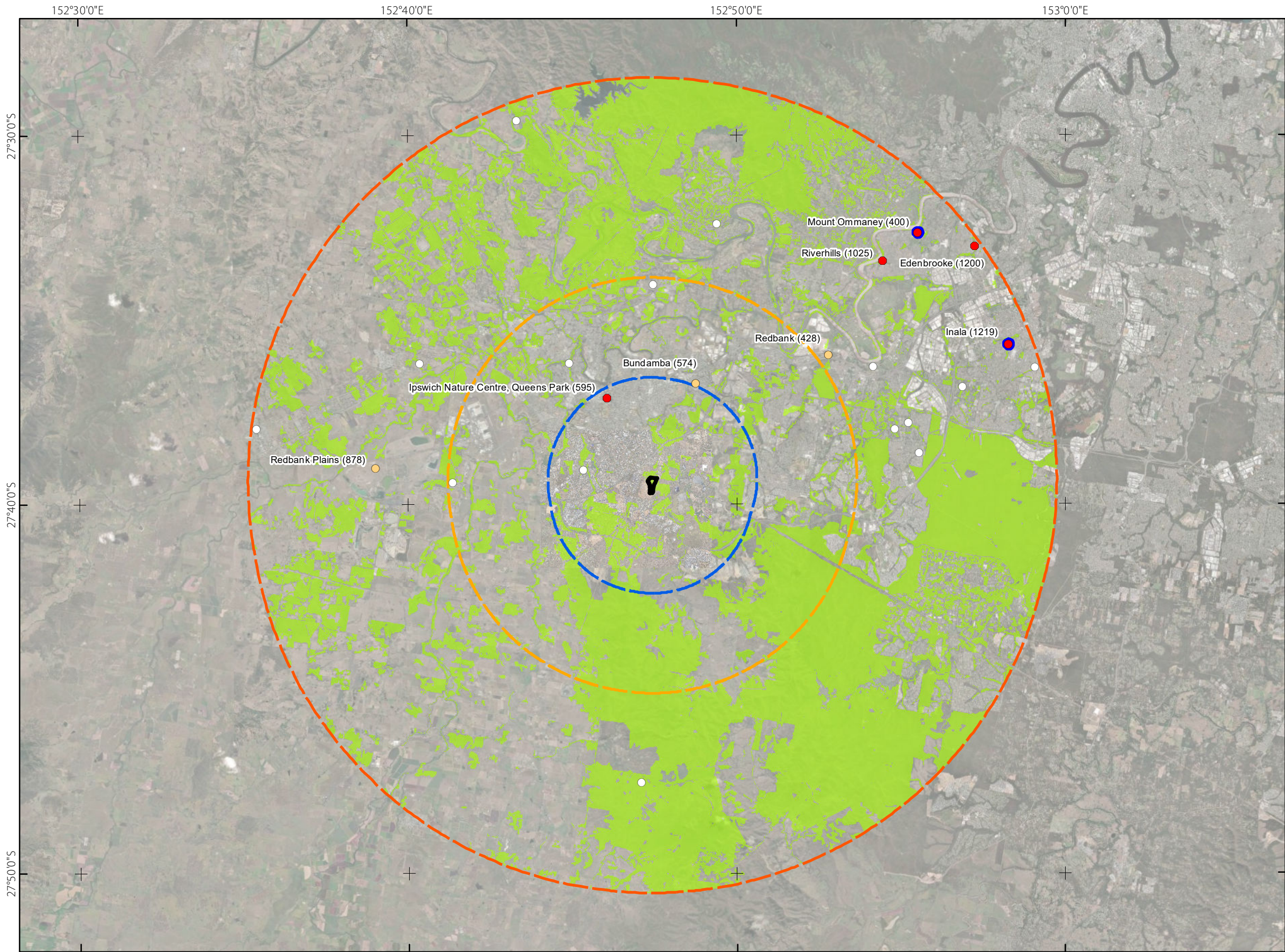
- Legend
- Impact Site
 - Major road
 - 1km Referral Area Buffer
 - Percentage of Referral Area boundary length supporting a Koala critical habitat connection off and on site - 62.8%
 - Percentage of Koala critical habitat within 1km of Referral Area (49.1%)
 - Size of Koala critical habitat patch >200m corridor connectivity (85 ha)



A6. MHQA Koala Threats Assessment



A7. Grey-headed Flying-fox FHA Context Analysis



Notes:
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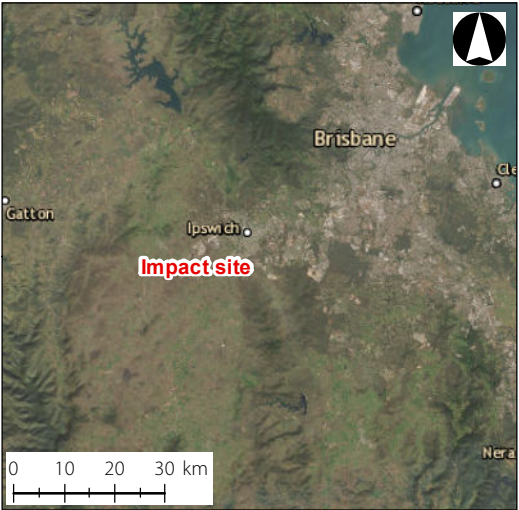
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Legend

- Impact Site
- Site 20km Buffer
- Site 10km Buffer
- Site 5km Buffer
- Grey-headed Flying-fox (*Pteropus poliocephalus*) Foraging Habitat within 20km of Site - 38%

Grey Headed Flying Fox Camp Locations

- Grey-headed Flying Fox roost inactive within recent surveys (15)
- Grey-headed Flying Fox roost active within recent surveys (3)
- Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above (3)
- Nationally significant Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above (2)



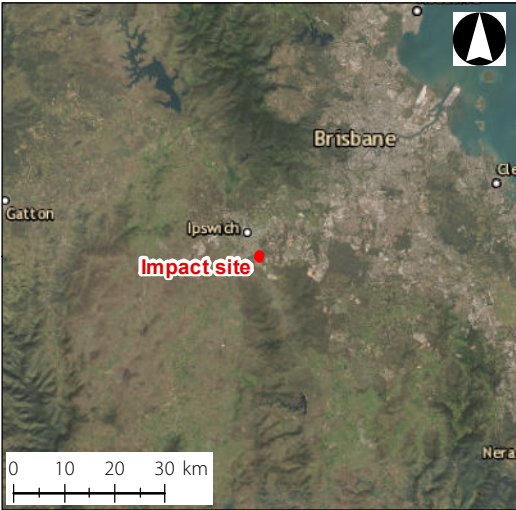
A8a. Greater Glider Habitat Analysis



Notes:
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- Legend
- Impact Site
 - Site 20km Buffer
 - Site 10km Buffer
 - Site 5km Buffer
 - Greater Glider Foraging Habitat within 20km of Site - 38%
 - Greater Glider (*Petauroides volans*) records within 20km of Impact Site Within the past 20 years (ALA, 2026) - 14
 - Greater Glider sighting record (Non-ALA record, 2023.08)



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Ripley Project

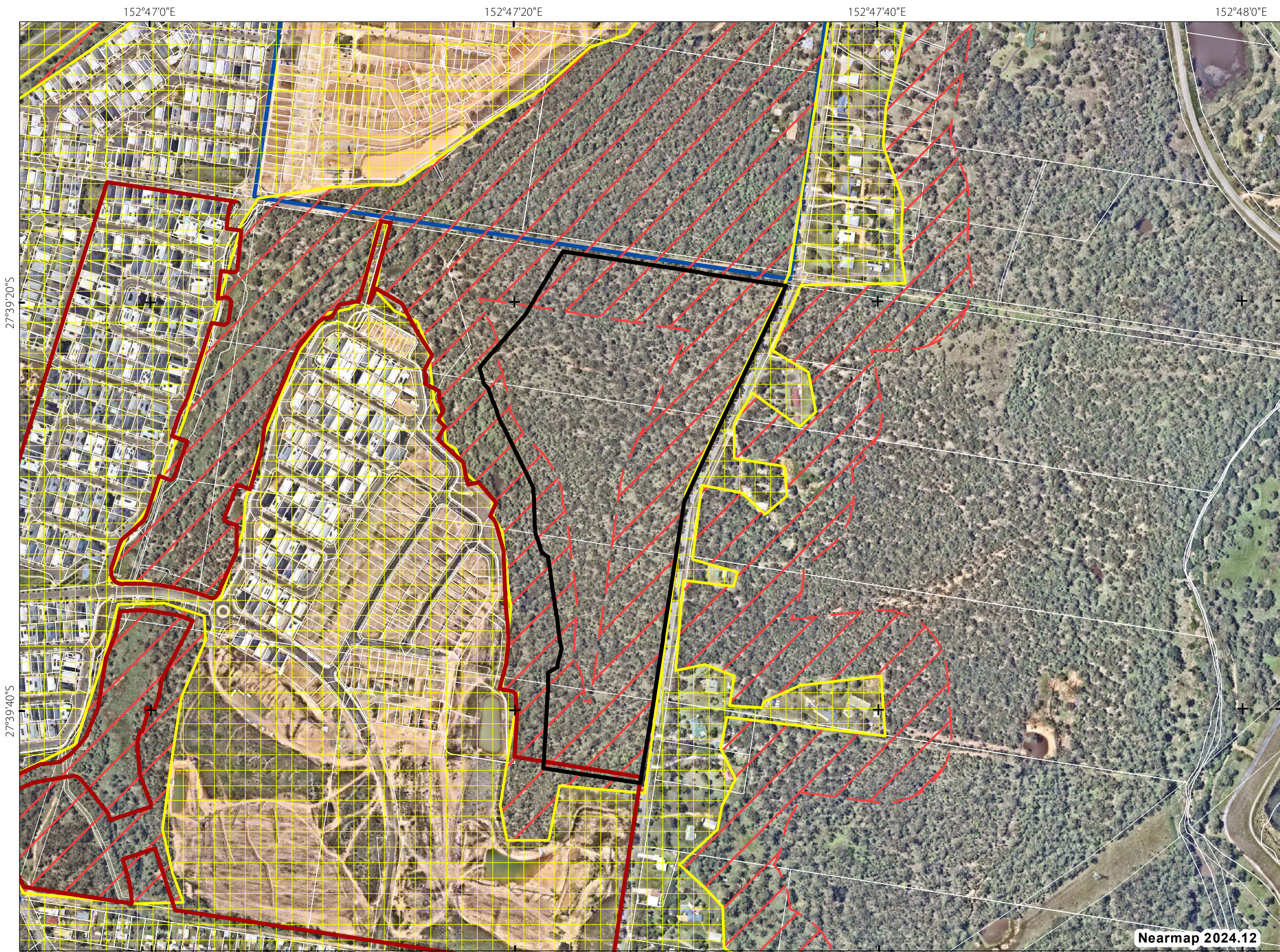


0 1 2 3 4 5 km
1:200,000
@ A3
Transverse Mercator
GDA 2020 | Zone 56

Address: RPD: 901SP317868
10835 E A8a IS Greater Glider CA D

Issue	Date	Drawn	Checked
D	3/08/2026	HW	AD

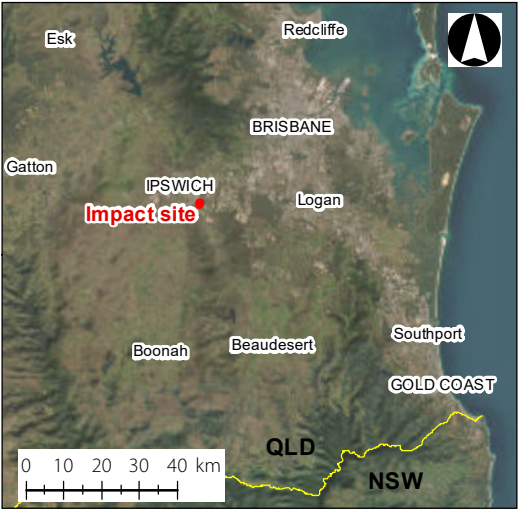
A8b. Contemporary Aerial Imagery



Notes:
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- Legend
- Qld DCDB
 - Referral area
 - 2017-8095 approval area
 - 2020/8615 approval area
 - Existing developed areas
 - 100m buffer to existing developed areas & EPBC approval areas



A8c. 1978 Aerial Imagery

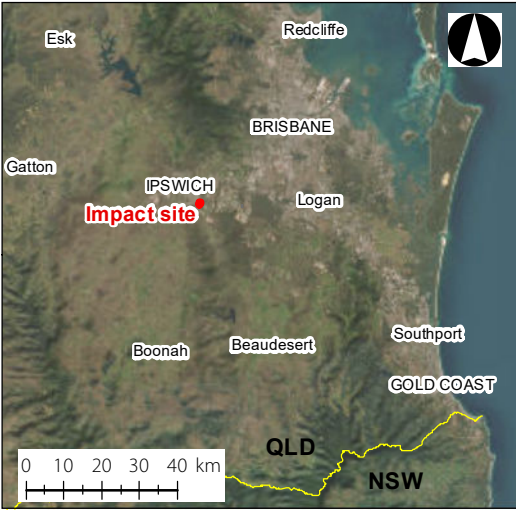


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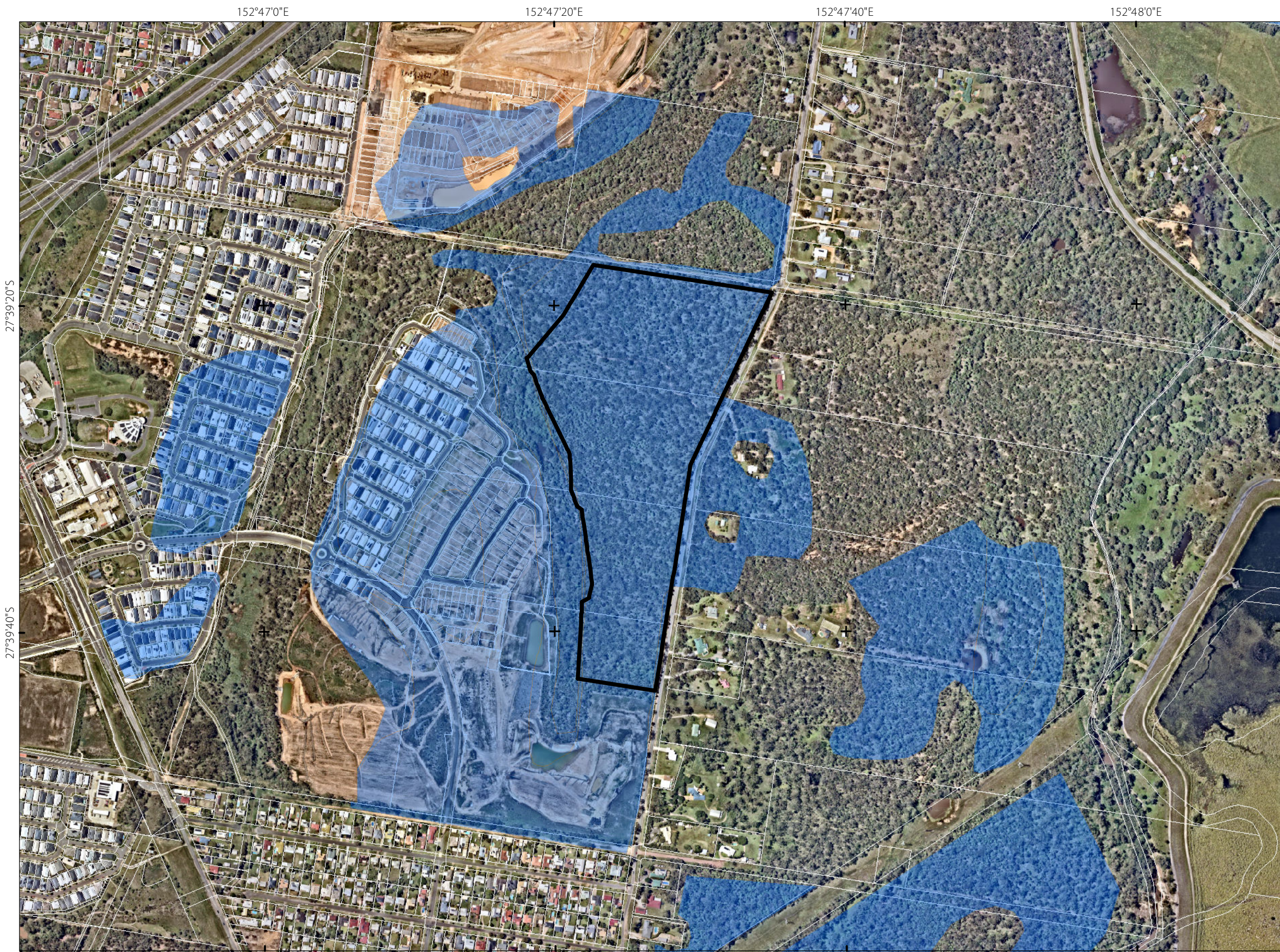
Layer Sources
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Legend

 Referral area



A8d. Qld VMA Remnant Vegetation Mapping

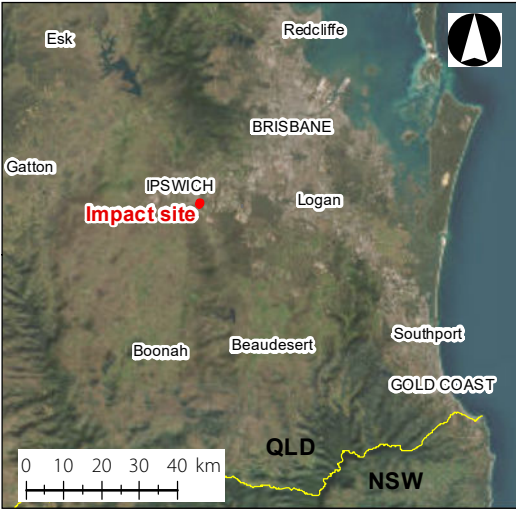


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Legend

- Qld DCDB
- Referral area
- VMA Remnant Vegetation mapping



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

Ripley Project

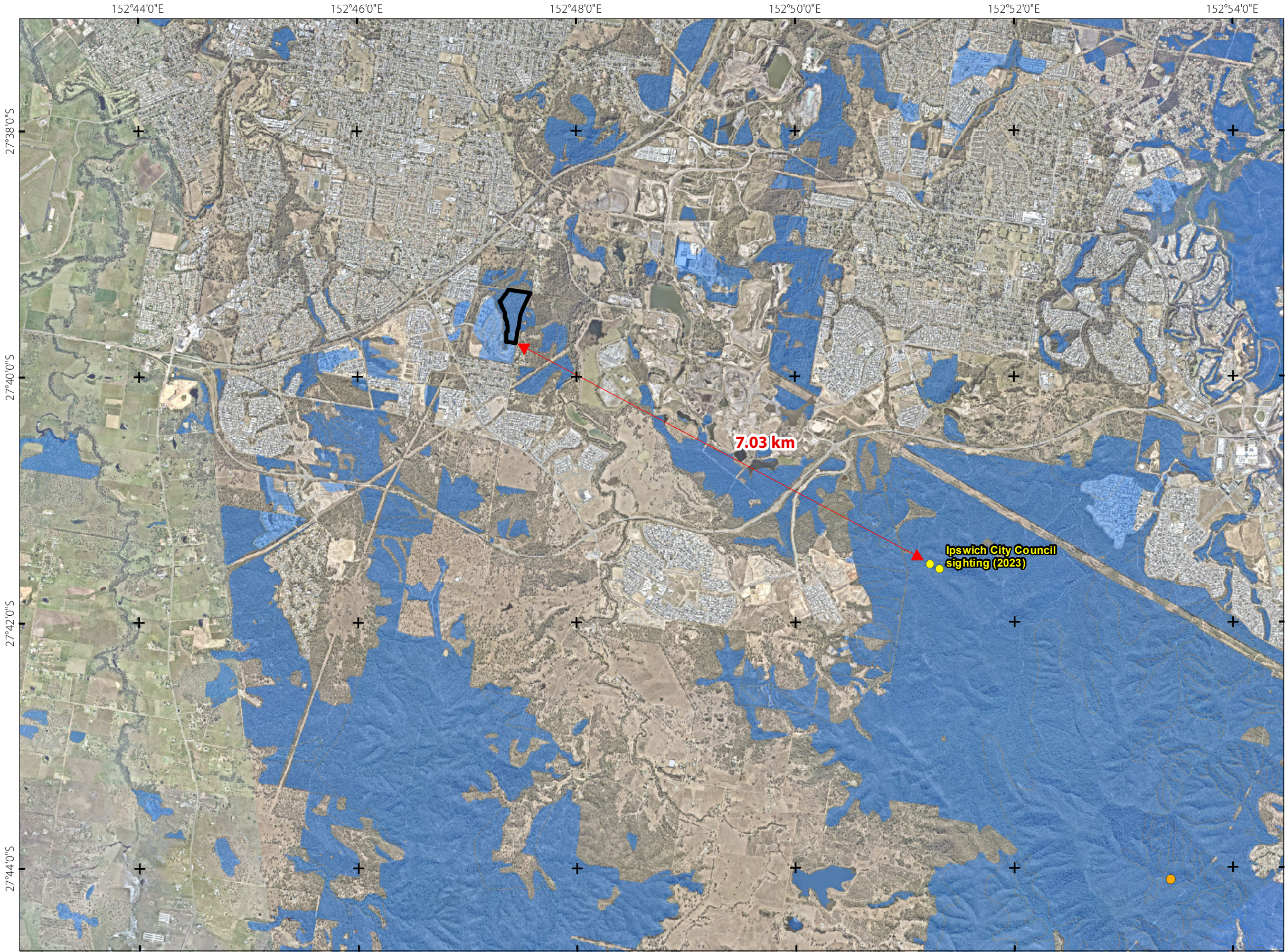


0 100 200 m
1:7,500
@ A3
Transverse Mercator
GDA 2020 | Zone 56

Address: Bushman Drive, Riverbend
10835 E A8d GG VMA Remnant B

Issue	Date	Drawn	Checked
B	3/08/2026	HW	AD

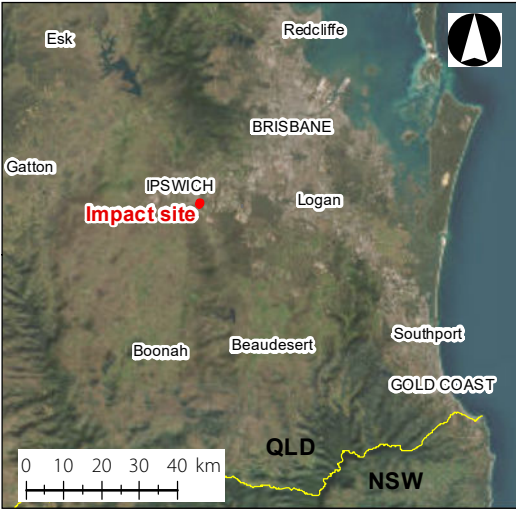
A8e. Distance To Nearest Recent Greater Glider Record & Qld VMA Remnant Vegetation



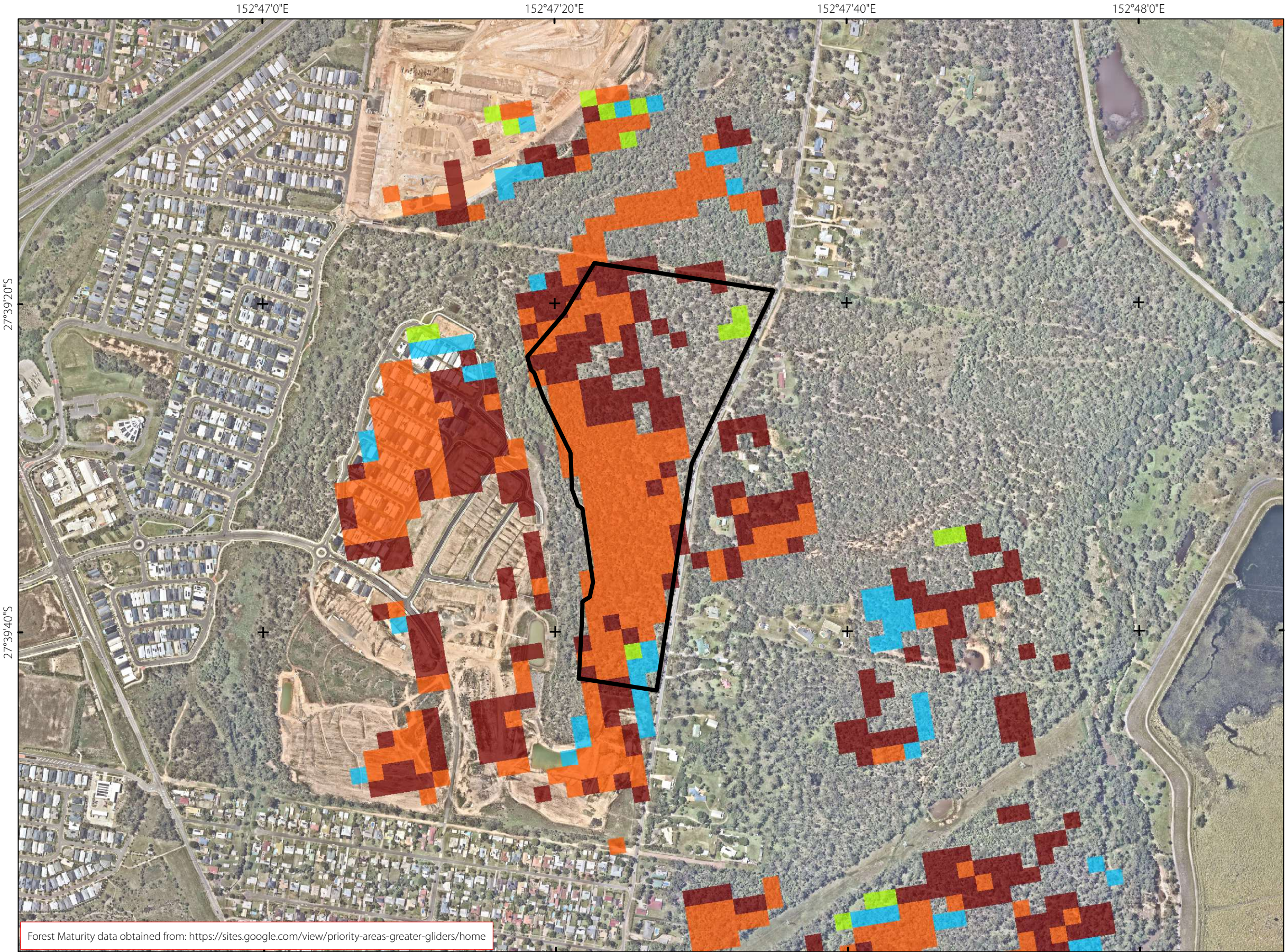
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- Legend
- Qld DCDB
 - Referral area
 - VMA Remnant Vegetation mapping
 - Greater Glider sighting record within the last 5 years (ALA, 2026.07)
 - Greater Glider sighting record within the last 5 years (Non-ALA record, 2023.08)
 - *undated records not displayed



A8f. Forest Mature Type Map (Griffith University)



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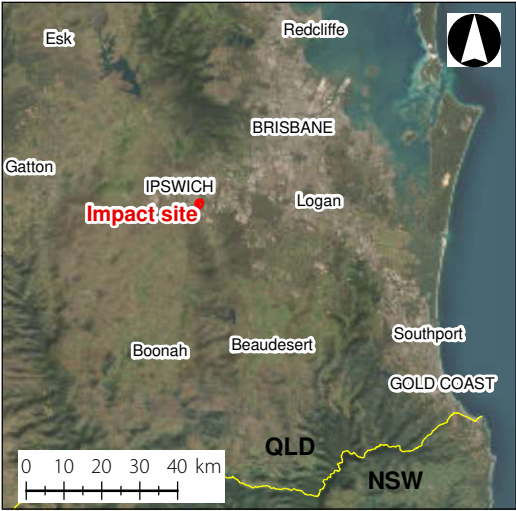
Legend

Qld DCDB

Referral area

Forest Maturity

- Mature Vegetation
- "" (Intermediate to Mature Aged Vegetation)
- Intermediate Aged Vegetation
- "" (Young to Intermediate Aged Vegetation)
- Young Vegetation



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Ripley Project

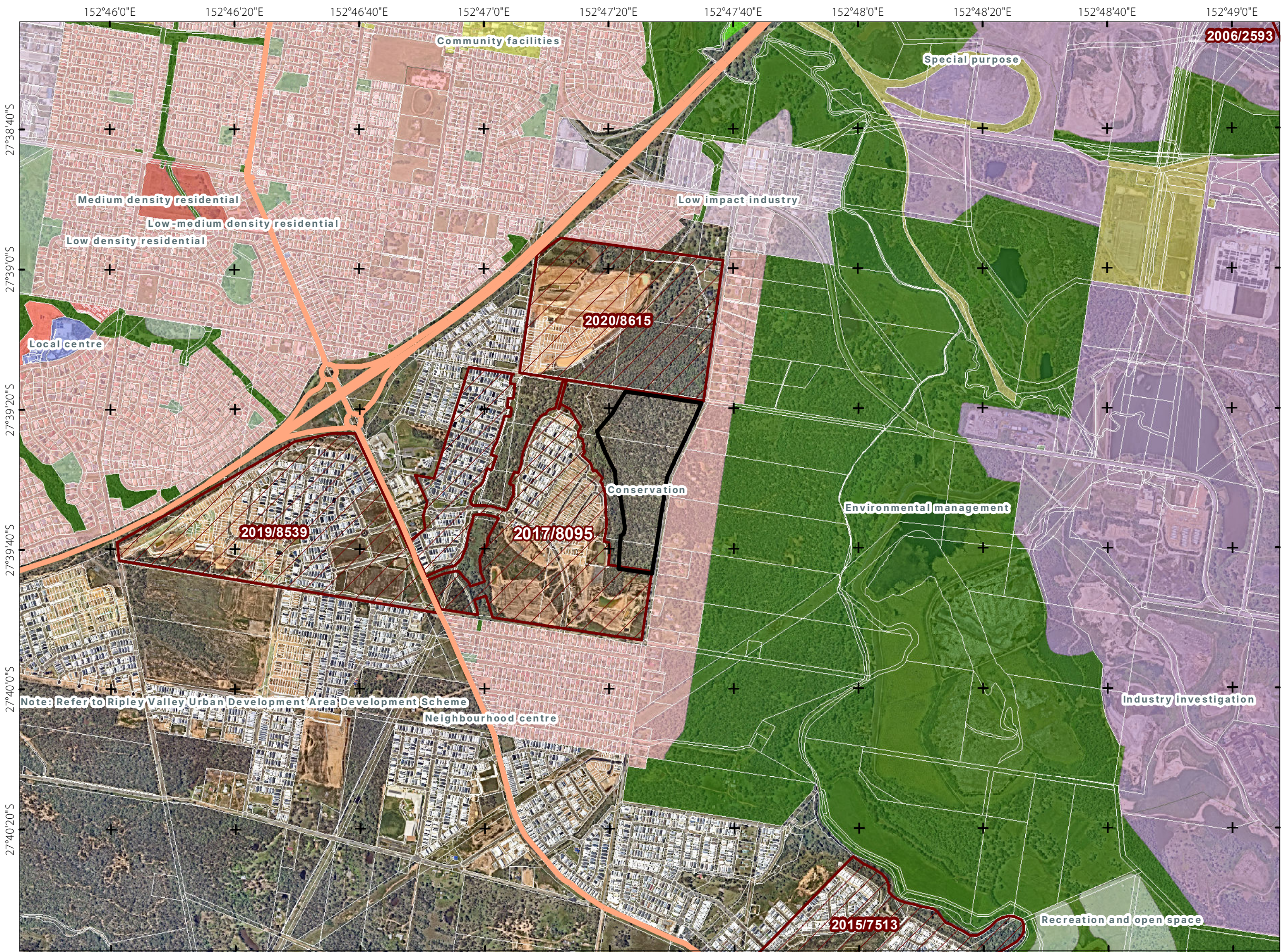


0 100 200 m
1:7,500
@ A3
Transverse Mercator
GDA 2020 | Zone 56

Address: Bushman Drive, Riverbend
10835 E A8f GG Forest Mature Map B

Issue	Date	Drawn	Checked
B	3/08/2026	HW	AD

A8g. Surrounding Land Zoning & EPBC Approvals



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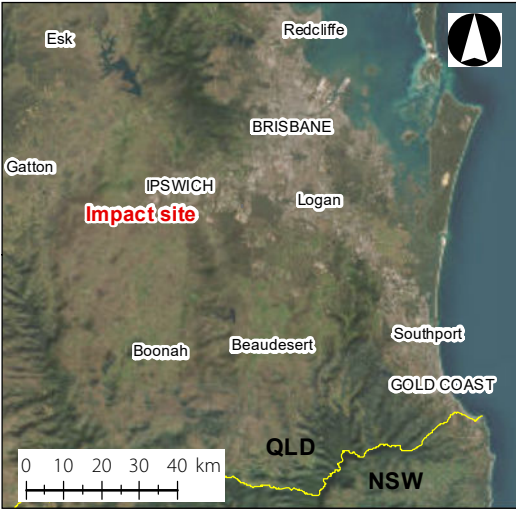
Legend

- Qld DCDB
- Referral area
- Highways/Major roads
- EPBC Approvals

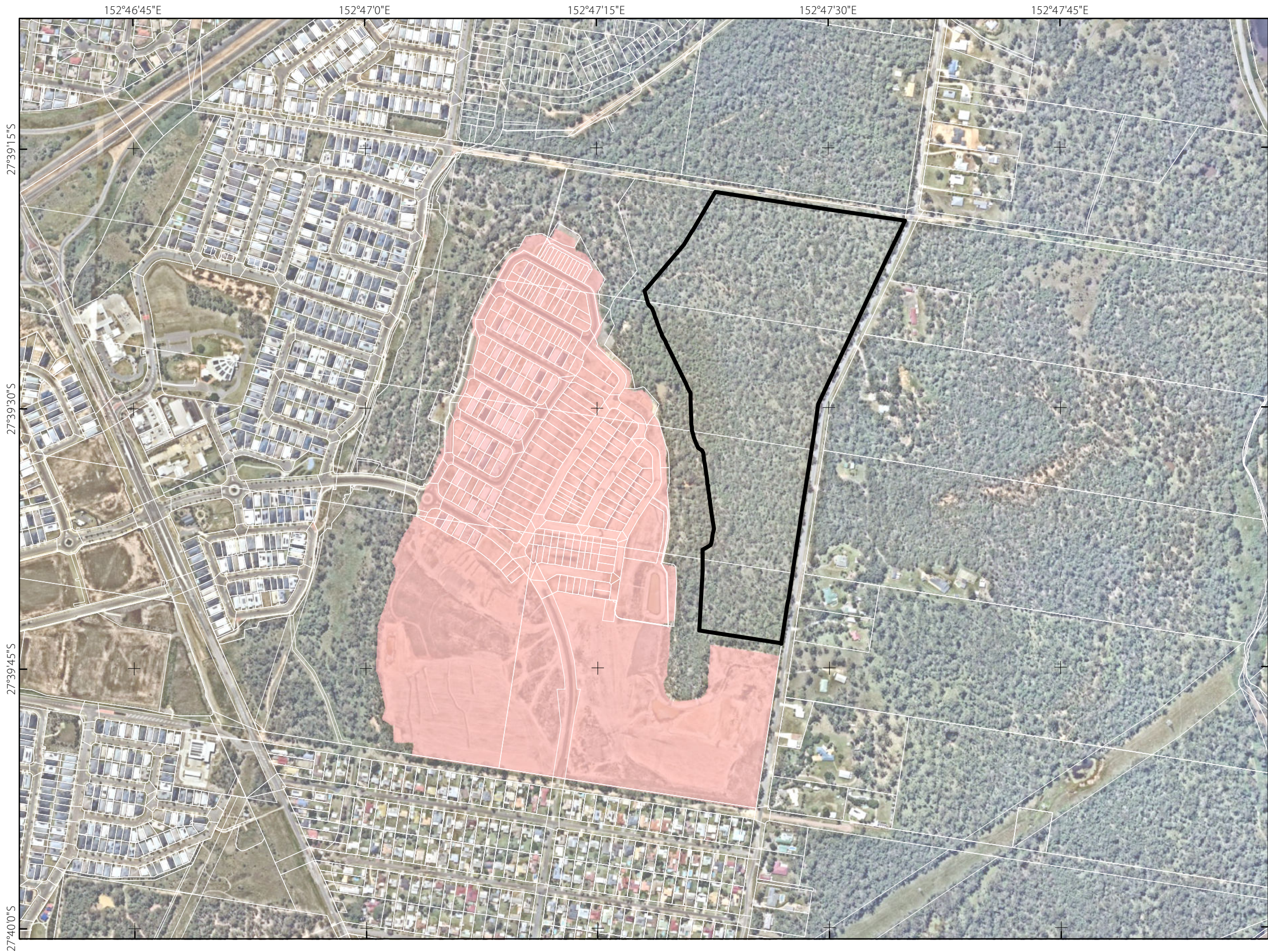
ICC Ipswich Planning Scheme

- Environmental management
- Low density residential

Note: Refer to Ripley Valley Urban Development Area Development Scheme



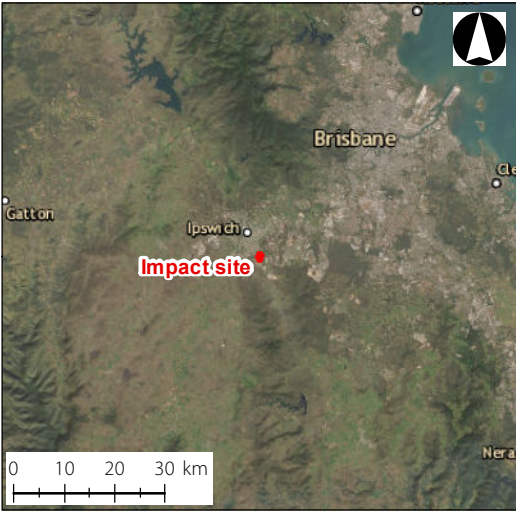
A9: Neighbouring Hayfield Estate Fauna Spotter Reports



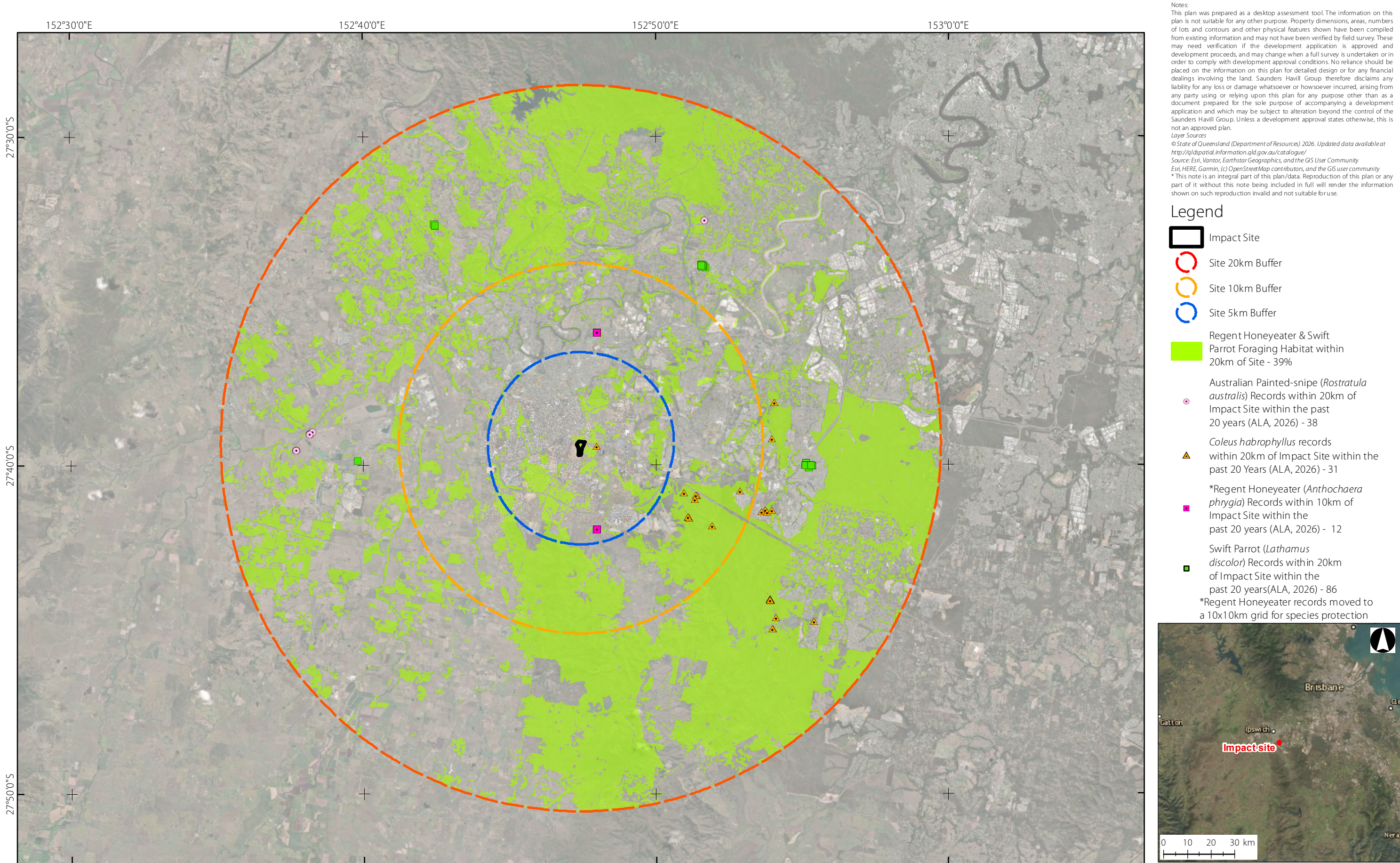
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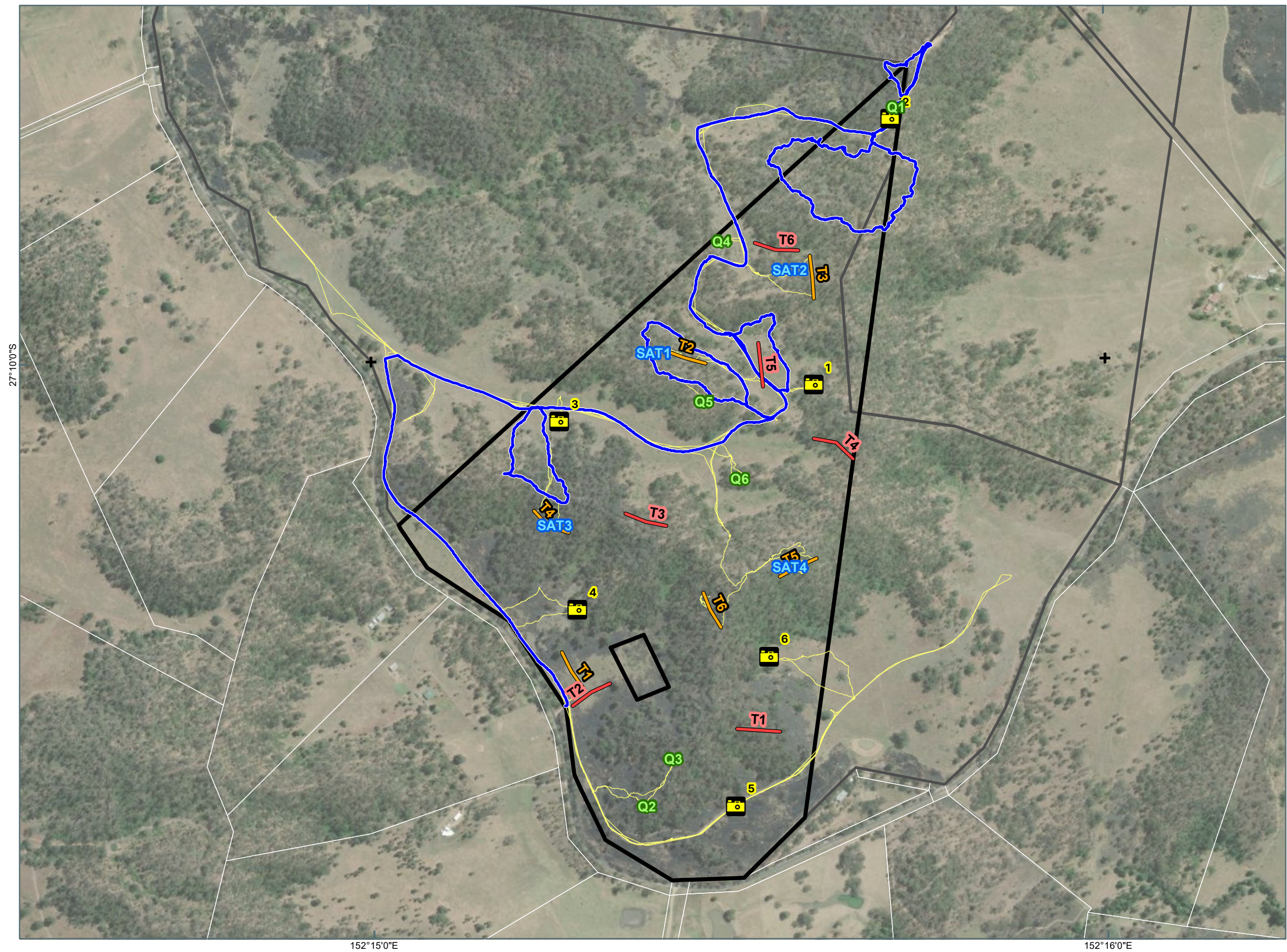
- Legend
- Qld DCDB
 - Impact Site
 - Hayfield development recent clearing extents. Fauna spotter reporting conducted pre-clearing and during clearing works.



A10. Other Threatened Species Habitat Analysis



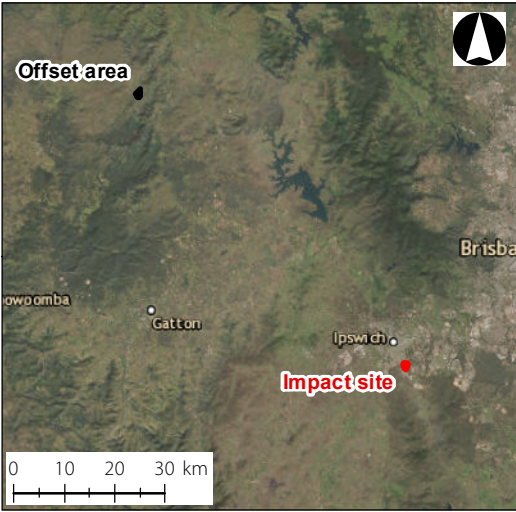
A11. Offset Area Baseline Field Survey Effort



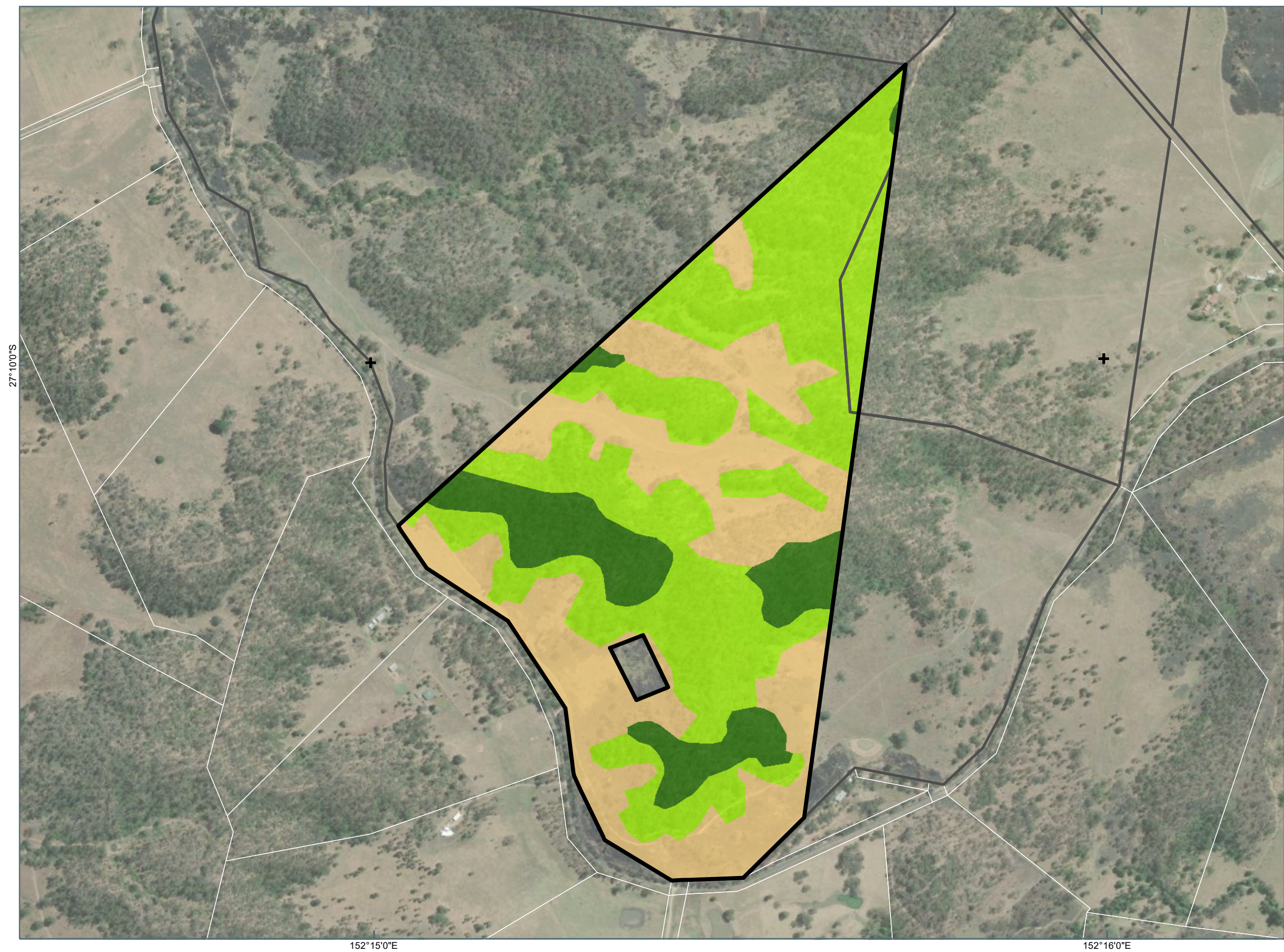
Notes:
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- Legend
- Qld DCDB
 - Offset Property
 - Offset Area
 - MHQA Transects
 - SAT Survey Locations
 - Spotlighting Survey
 - Quaternary Survey Locations
 - Camera Trap Locations
 - Weed Transect (Baseline)
 - Observational surveys



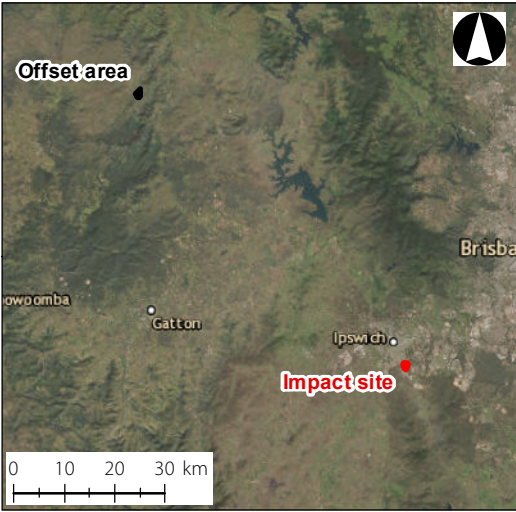
A12. Offset Area Assessment Units



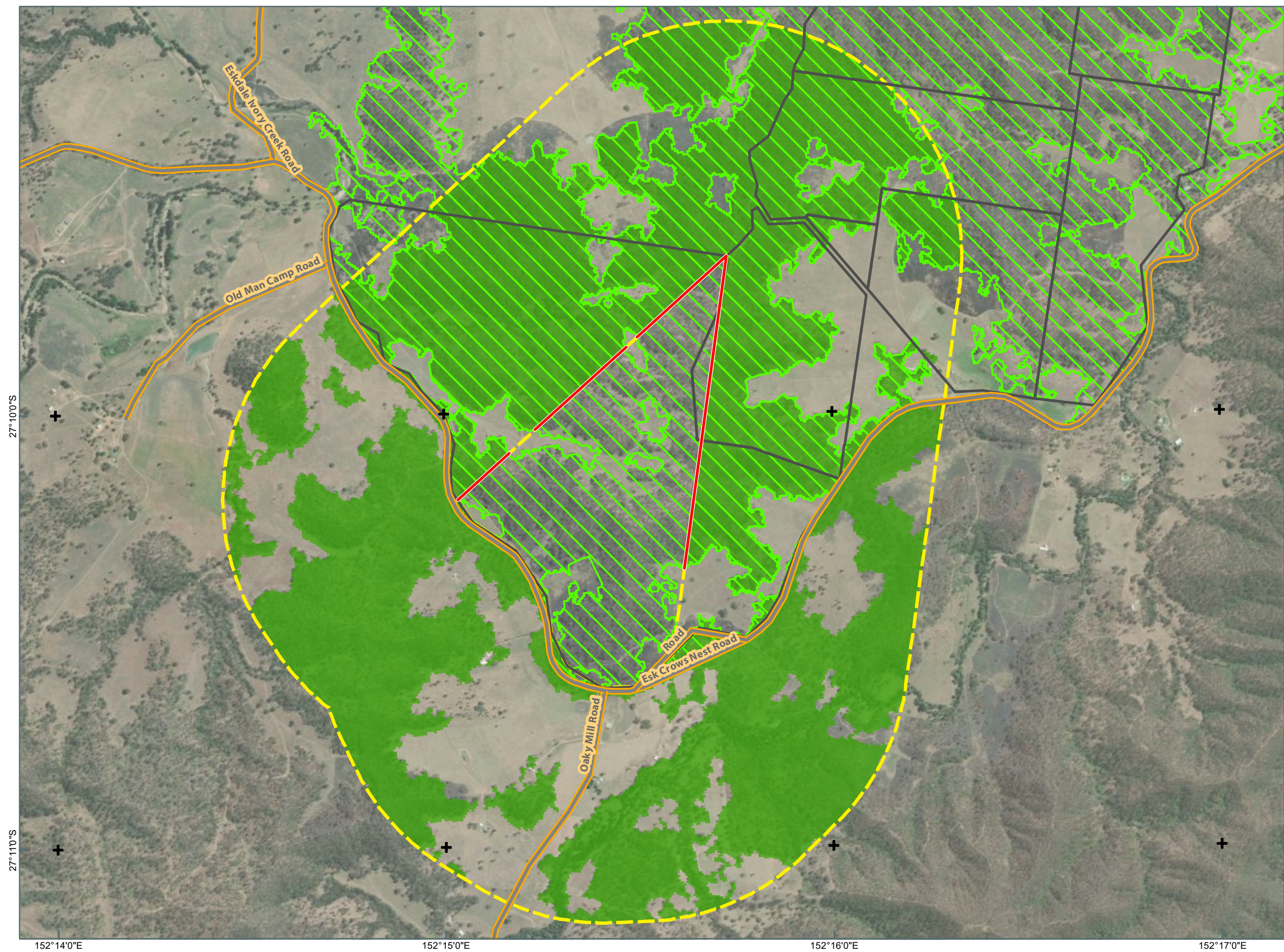
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- Legend
- Qld DCDB
 - Offset Property
 - Offset Area
- Assessment Units
- Assessment Unit 1:
Category X - Open paddock
[36.3 ha]
 - Assessment Unit 2:
Category X - Regrowth vegetation
[50.5 ha]
 - Assessment Unit 3:
Remnant vegetation
[14.0 ha]



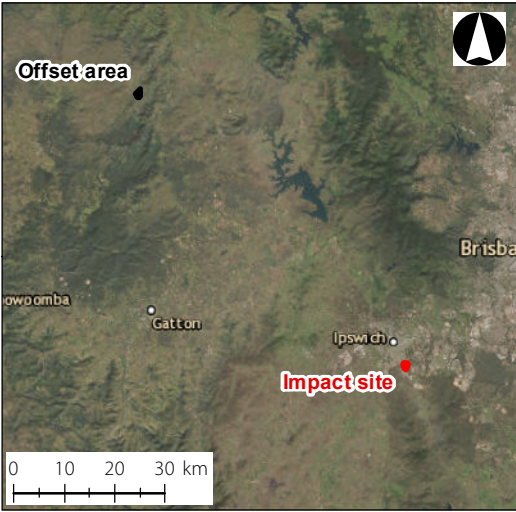
A13. Offset Area Koala Context Assessment



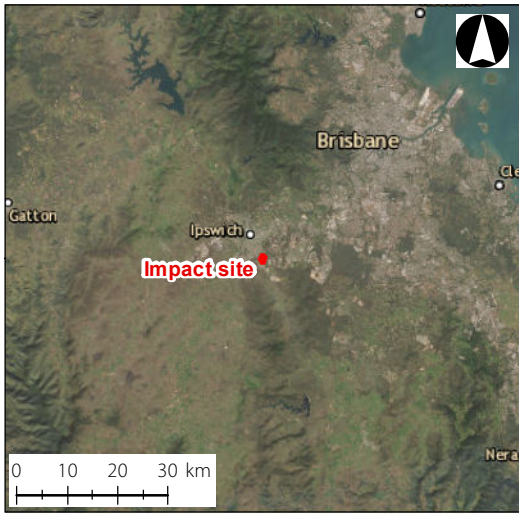
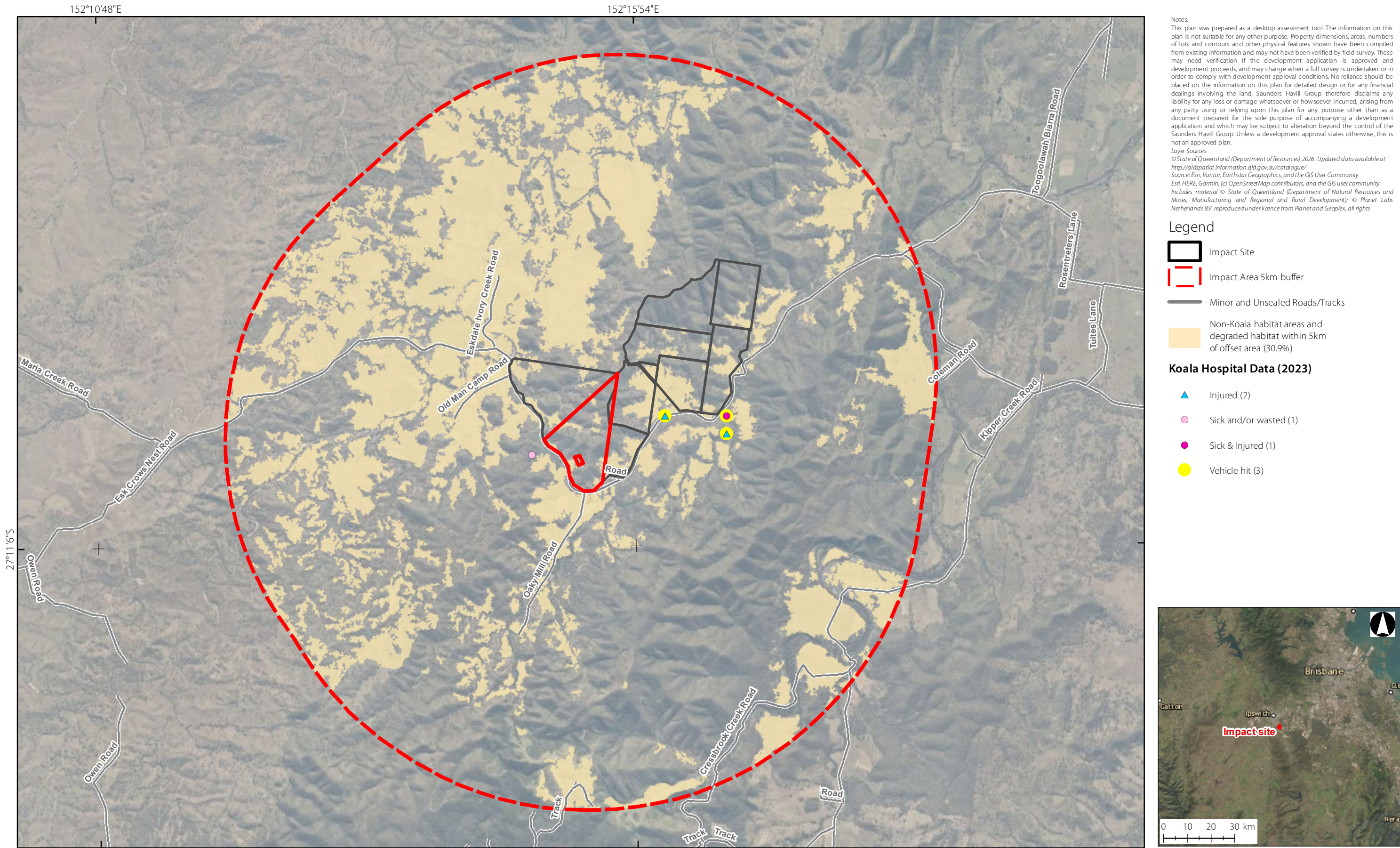
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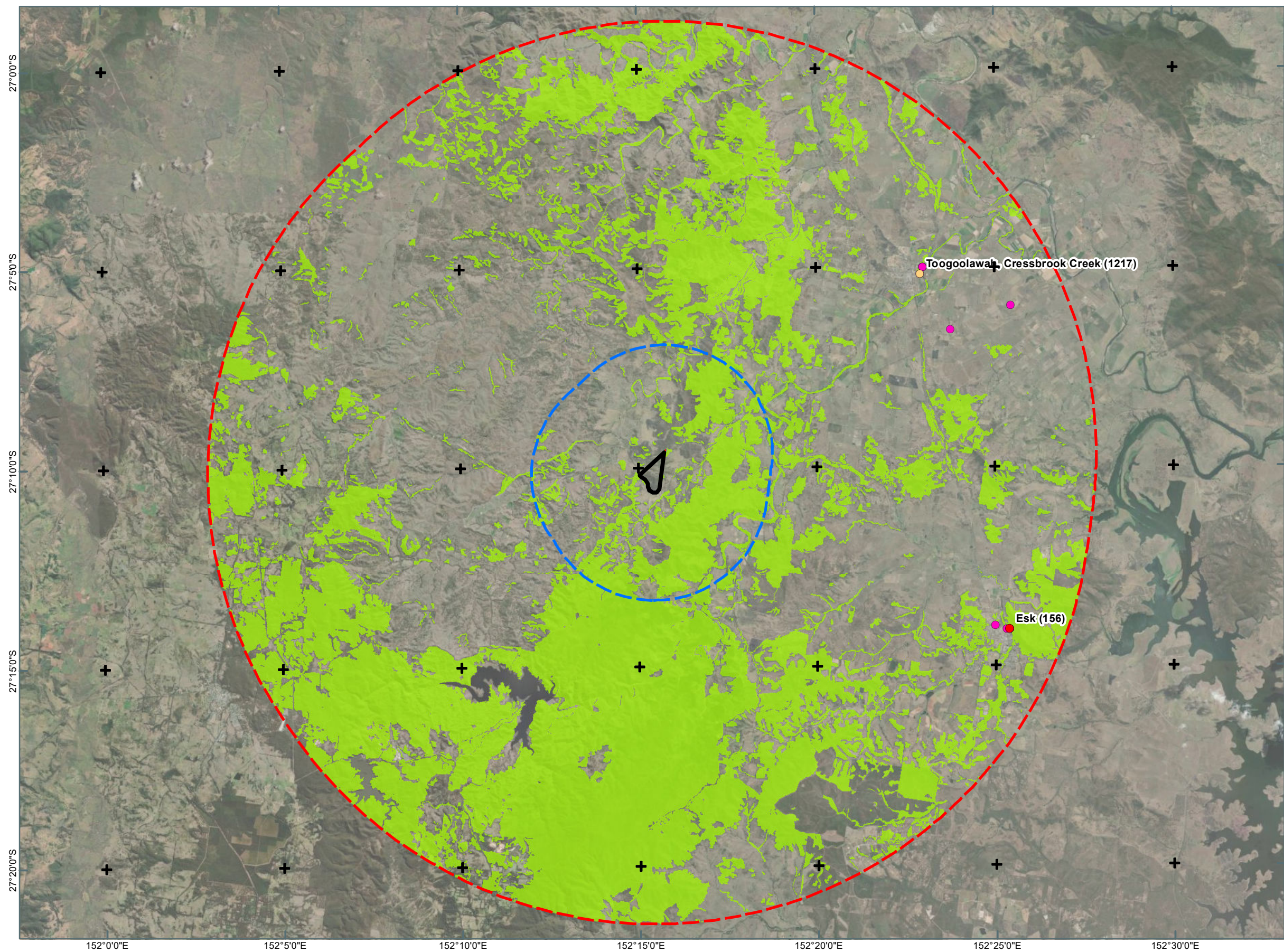
- Legend
- Offset Property
 - Offset Area
 - Major & Arterial Roads
 - Percentage of offset area boundary supporting a Koala critical habitat connection off and on site - 57.4%
 - 1km Offset Area buffer
 - Percentage of Koala critical habitat within 1km of offset area (65.5%)
 - Size of Koala critical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



A14. Offset MHQA Koala Threats Assessment



A15. Offset Area GHFF Context Assessment



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- Legend
- Qld DCDB
 - Offset Area
 - 5km Offset Area buffer
 - 20km Offset Area buffer
 - Potential and known Grey-headed Flying-fox foraging habitat within 20km of offset area - 37%
 - Grey-headed Flying-fox records within 20km of impact site recorded within past 20 years (28)
 - GHFF Roosts (Fed. Gov., 2024)
 - Grey-headed Flying Fox roost inactive within recent surveys [0]
 - Grey-headed Flying Fox roost active within recent surveys [1]
 - Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [1]
 - Nationally significant Grey-headed Flying Fox roost active within recent surveys [0]
 - Nationally significant Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [0]

