New Beith Road Upgrade, Flagstone, Queensland (EPBC 2023/09505)

Preliminary Documentation Report - Part A

Peet Flagstone City Pty Ltd
November 2025

Saunders Havill

PATHWAYS TO SUCCESS

Document Control

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Abbreviations, Acronyms and Definitions

CAR – Controlled Action Referral

DEECCW – (Commonwealth) Department of Environment, Energy, Climate Change and Water

DBH – Diameter at Breast Height

EDA – Economic Development Act 2012

EDQ – Economic Development Queensland

EPBC Act –Environment Protection and Biodiversity Conservation Act 1999 (Cth)

ESD – Ecologically Sustainable Development, as defined by Section 3A of the EPBC Act

EVNT – Endangered, Vulnerable or Near Threatened species listed under Queensland's Nature Conservation Act 1992

GFUDA - Greater Flagstone Urban Development Area

GFUDADS - Greater Flagstone Urban Development Area Development Scheme

ha – hectare

km – Kilometres

km/hr – kilometres per hour

Koala Habitat – means the following:

a) Any area that provides or is likely to provide the essential life cycle requirements of the Koala, including dispersal, foraging and or breeding habitat as described in:

i. Conservation Advice for Phascolarctos cinereus (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory, Commonwealth of Australia 2022

ii. National Recovery Plan for the Koala Phascolarctos cinereus (combined populations of Queensland, New South Wales and the Australian Capital Territory), Commonwealth of Australia 2022

iii. A review of Koala Habitat assessment criteria and methods, Youngentob, K.N, Marsh, K.F., Skewes, J. 2021 Koala Exclusion Fencing is exclusion fencing as described in Table 4.2 of the Koala-Sensitive Design Guideline: A guide to koala sensitive designed measures for planning and development activities 2022 (Qld).

LCC - Logan City Council

LGA – Local Government Area

m – metre

m^2 – square metre

MNES – Matter(s) of National Environmental Significance. Under the Environment Protection and Biodiversity Conservation Act 1999 there are nine defined matters the require consideration when proposing to undertake an 'Action'. One of these is Nationally listed threatened species and ecological communities. MNES relevant to the New Beith Road Development are identified and described herein.

NC Act – Nature Conservation Act 1992 (Qld)

PD Report – Preliminary Documentation Report (this document)

PDR – PD Request

Planning Regulation – Planning Regulation 2017 (Qld)

Proponent – Peet Flagstone City Pty Ltd

Proposed Action – New Beith Road Upgrade (EPBC Referral 2023/09505)

Protected Matter(s) – means a matter protected under a controlling provision in Part 3 of the EPBC Act for which this Preliminary Documentation Report has effect.

Regional Ecosystem (RE) – means vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil (Sattler and Williams 1999, Vegetation Management Act 1999 (Qld)).

REDD – Regional Ecosystem Description Database

SEFFW - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

ShapingSEQ – ShapingSEQ;- South East Queensland Regional Plan 2017

SHG – Saunders Havill Group

Significant Residual Impact – The area of enduring habitat loss at the Impact Site after all avoidance and mitigation strategies have been deployed as a result of direct impacts associated with the Proposed Action.

1. Introduction

1.1.Background

In July 2023, Saunders Havill Group (**SHG**) submitted a Controlled Action Referral (**CAR**) on behalf of Peet Flagstone City Pty Ltd ('**the Proponent'**) to the Commonwealth Department of Environment, Energy, Climate Change and Water (**DEECCW**) for the Proposed Action. The CAR (refer **Appendix 1**) was lodged in regard to a proposed new road upgrade at New Beith Road, Flagstone (the Proposed Action).

SHG act on behalf of the Proponent in the coordination and production of the response to the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) Controlled Action Determination assessment on Preliminary Documentation (**PD**) for the proposed New Beith Road Upgrade, Flagstone, Queensland (**EPBC Reference: 2023/09505**). The site is located at New Bieth Road, Flagstone and site is centred on the coordinates – 27.76894, 152.93690 (refer **Figure A1** and **A2** for site context and aerial imagery).

The Proposed Action is "*to clear vegetation, conduct earthworks and install associated infrastructure to upgrade and widen 3.2 km of New Beith Road, Flagstone, Queensland (See EPBC Act referral 2023/09505) Notification of referral decision and designated proponent control action assessment approach decision was provided by DEECCW on 2nd August 2023*" as per decision on assessment approach dated 2nd August 2024 (**Appendix A1**). The Proposed Action was deemed a Controlled Action and would therefore require further assessment and approval under the EPBC Act before proceeding. The relevant controlling provisions include;

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

Further information required for PD for New Beith Road Upgrade, Queensland was provided by DCCEEW on 22nd November 2023, made under s95A(2) of the EPBC Act (refer **Appendix A2**).

As such this reporting provides the assessment by PD as per referral decision notice (**Appendix A2**). The decision notice identified the relevant controlling provision as listed threatened species and communities, with the Proposed Action considered likely to have a significant impact (**SI**) on two (2) Matters of National Environmental Significance (**MNES**)

- **Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered**
- ***Phascolarctos cinereus* (koala – combined populations of Queensland, New South Wales and the Australian Capital Territory) (koala)**

Further, DEECCW has requested the proponent consider whether the Proposed Action has the potential to have a significant impact on two additional MNES species, being:

- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable
- Greater Glider (*Petauroides volans*) – Endangered
- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) – Vulnerable

- Swift Parrot *(Lathamus discolor) – Critically endangered*
- Regent Honeyeater *(Anthochaera phrygia)- Critically Endangered*
- Yellow-bellied Glider *(Petaurus australis australis) – Vulnerable*
- Spotted-tailed Quoll *(Dasyurus maculatus maculatus) – Endangered*

The decision notice identified that further assessment was to be undertaken along the PD pathway. The decision notice and associated correspondence are provided in **Appendix A1** and **Appendix A2**.

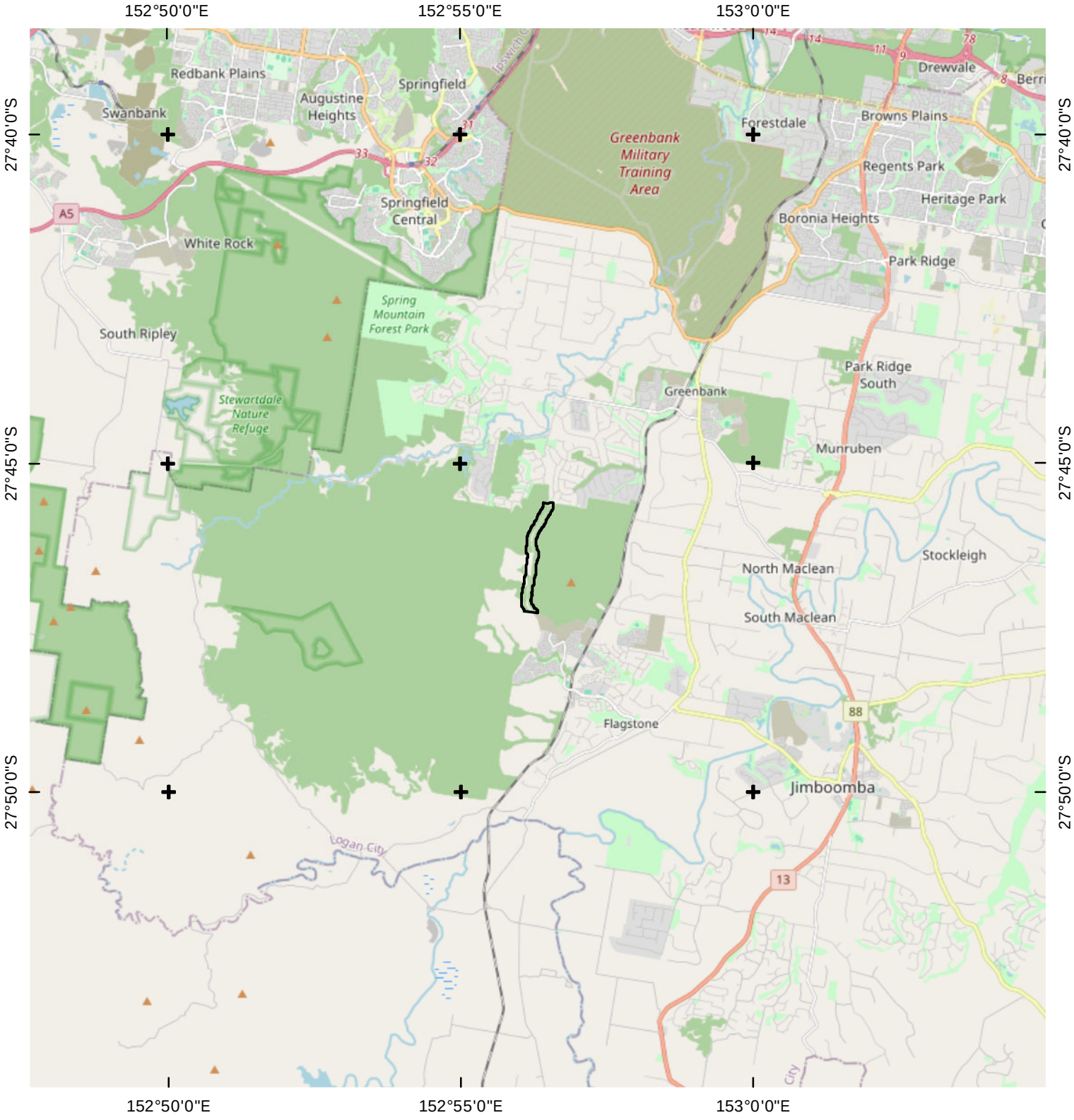
1.2. Site Context

The Proposed Action is located on an existing road reserve, herein referred to as the 'Site'. The Site comprises the following areas of land as shown in **Plan A1** - Proposed Development;

- Referral Area 90.4 ha
- Existing road/cleared track 4.4 ha
- Impact Area (development extent, batters and 5 m construction buffer) 18.9 ha
- Balance referral area (includes 100 m buffer to construction extent) 67.1 ha

The locality and context of the Site are shown in **Figure A1** and **Figure A2** respectively, with the Impact Area and Referral Area defined in **Plan A1** and historical imagery in **Plan A2**. The Proposed Action is situated in the Greater Flagstone Urban Development Area (**GFUDA**) wholly located in the in the Logan City Council (**LCC**) Local Government Area (**LGA**) of south-east Queensland. Economic Development Queensland (**EDQ**) assesses development applications in the GFUDA with all development applications assessed against the Greater Flagstone Urban Development Area Development Scheme (**GFUDADS**). The character of these areas is described further in Section 2 of this PD report.

The proposed action is for an upgrade to the existing unsealed New Beith Road to deliver a transport corridor required to service the former GFUDA (now termed Greater Flagstone Priority Development Area, or **GFPDA**). In the GFPDA, various projects have existing approvals, with EPBC Act approvals and developments under assessment shown in **Plan A3**. While the road extent aligns with the existing disturbed road reserve, the action will require the clearing of vegetation for road widening/batters and a construction buffer of 5 m. This report responds to the PD request under s95A(2) of the EPBC Act as per letter dated 22nd November 2023 (**Appendix A2**).



LEGEND

Referral Area

Figure A1

Site Context

CLIENT

PEET Flagstone City Pty Ltd

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:150,000

0 1 2 3 4 5 km

N

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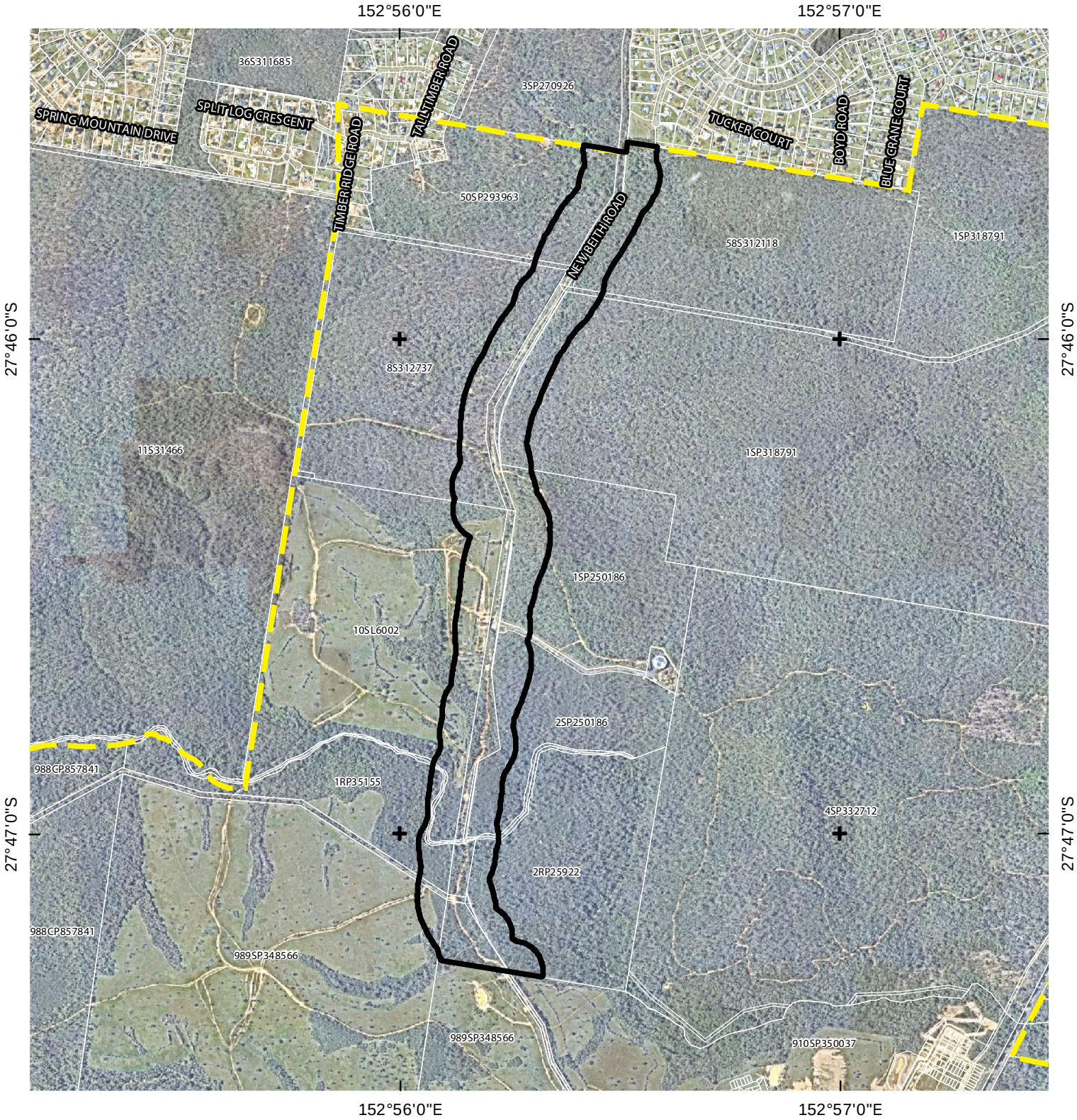
FILE REFERENCE
8418 E Figure 1 NBR Site Context A

DATE 10/07/2025



LEGEND

- Qld DCDB
- Referral Area
- Greater Flagstone Priority Development Area

Figure A2

Site Aerial

CLIENT

PEET Flagstone City Pty Ltd

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:20,000

0 100 200 300 400 500 m

N

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FILE REFERENCE
8418 E Figure 2 NBR Site Aerial A

DATE 10/07/2025

1.3. Reference Table

Reference Table

In response to Item 1.1of the PD request, which requires *'include a reference table indicating where to find information and links within the document to relevant sections. Where relevant information was provided in the referral, please incorporate, or cross reference to this information as necessary in the preliminary documentation.',* this section provides a reference table (**Table A1**) indicating report chapters that correspond with items requested within the additional information request included as **Appendix A2**. Each item has been extracted and provided within the corresponding chapter of this PD.

Table A1: Reference Table

RFI Item		Response Section
Attachment A – Request for additional information required for assessment by preliminary documentation		
1	**n/a – General content, format and style**	**n/a**
2	**Description of the action**	**2**
The preliminary documentation must include:		
2.1	a) A description of all components of the proposed action (such as preconstruction, construction and operational), including the staging, sequencing, duration and timing	2.1
	b) A description of the anticipated start and completion dates of all actions such as the extent, staging and timing of clearing undertaken over the construction period.	2.2
	c) The location, extent, and size (in hectares) of the total project footprint, disturbance/impact footprint, and of any adjoining areas (beyond the impact area) that may be subject to indirect or facilitated impacts, including edge effects, noise or light spill, vehicle access or other associated activities.	2.3
	d) A description, with supporting spatial information, detailing all site access roads and any other shared infrastructure with adjacent projects/areas to be constructed to facilitate the proposed action. Please describe any changes to project or disturbance footprints that may have occurred since the original referral. Please note these changes may require a formal variation request.	2.4
2.2	Information that delineates the footprint and activities of the proposed action from adjacent proposed or existing developments	2.5
2.3	Provide a description of the intended land uses proposed as part of the completed development, including any proposed open space and/or conservation areas and associated ongoing activities, and details of the intended part that would be responsible for future management activities	2.6
2.4	Details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies or is likely to apply to the proposed action. Details should include (but are not limited to): a) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy?.	2.7

RFI Item		Response Section
	b) application/approval numbers for existing applications where relevant	2.7
	c) obtained approvals or additional approvals that are required.	2.7
3	**Description of the environment and Matters of National Environmental Significance**	3
The preliminary documentation must provide a description of the environment affected by and surrounding the proposed action area, over both the short and long term, including:		
3.1	A description of the environment more broadly including previous and current land use within and surrounding the proposed action area.	3.1
3.2	A description of any potential listed threatened species or ecological community (including but not limited to those listed in this request for information) that occur in the project area and adjacent areas. *Please ensure that a recent Protected Matters Search Tool report is generated and used during the assessment before finalising the draft preliminary documentation to identify any additional species (listed at the time of the controlled action area) that may be affected by the proposal.*	3.3
3.3	For listed threatened species and ecological communities that have the potential, or are likely, to be present at and in the vicinity of the project site, including but not limited to those listed in this request, please provide a likelihood of occurrence assessment including the following:	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) on site and, where feasible, in the broader landscape.	3.3
	c) Quality and importance of known or potential habitat for the species or communities.	3.3
	d) Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.	3.3
	e) Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site.	3.3

RFI Item		Response Section
	Likelihood or occurrence and habitat assessments must be informed by up-to-date desktop and field surveys and informed by relevant departmental documents (e.g., approved Conservation Advice, Recovery Plans, draft referral guidelines and Listing Advice, and SPRAT Database) and/or species experts.	3.2.1
3.4	Up to date baseline and survey data at the impact site(s), and if relevant, the proposed offset site(s) site, including:	
	a) Information on the survey methodology or technique used (e.g., thermal detection, camera trapping, tree hollow search, SAT surveys etc)	3.4.2
	b) When surveys were conducted (e.g., dates, time of day, season, etc.) and survey effort (e.g., two hours for every one hectare within a 5-hectare area)	3.4.2
	c) Map/s of survey points or transects and how the survey points or transects were selected.	3.4
	d) An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines.	3.4.17
	e) Results of all surveys undertaken.	3.4.3-3.4.16
3.5	Based on survey data and with reference to relevant statutory documents, provide a clear description of the total extent and quality of habitat present within and surrounding the proposed action area for each species or ecological community potentially present or impacted by the action. For all species with residual significant impacts the method used to quantitatively assess the quality of habitat must be discussed and endorsed by the department before being applied.	3.5
4	**Impact assessment**	4
4.1	Include a clear description of the total extent and quality of the following:	
	a) The total extent of habitat present for each relevant protected matted within the project footprint	4.1
	b) direct and indirect impact areas (including the total extent of habitat for each relevant protected matter to be impacted)	4.1

RFI Item		Response Section
	c) habitat areas proposed to be retained/avoided (including the total extent of habitat present for each relevant protected matter to be avoided).	4.1
4.2	To inform point 4.1, please provide an assessment of the direct, indirect, facilitated and cumulative impacts that may occur as a result of the proposed action at a local and regional scale. The assessment should include consideration of: a) the nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable or irreversible.	4.3 TEC 4.4 Koala 4.5 Additional Species
	b) timing and whether the impact is temporary or permanent	4.3 TEC 4.4 Koala 4.5 Additional Species
	c) species specific habitat requirements such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable).	4.3 TEC 4.4 Koala 4.5 Additional Species
	d) whether connectivity and movement opportunities in the surrounding area may be retained, removed or functionally lost or compromised	4.3 TEC 4.4 Koala 4.5 Additional Species
	e) adjacent areas of habitat that may or will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence)	4.3 TEC 4.4 Koala 4.5 Additional Species
	f) indirect or facilitated impacts that may result from the proposed action, including but not limited to the following: *i.* Edge effects – including the potential for the introduction of weed species and pathogens in the referral area and adjacent environment. *ii.* Vehicle movement, resulting in disturbance and fauna. *iii.* Increased presence of dogs *iv.* Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil. *v.* Disturbance from increased noise, artificial light, sediment generation and other relevant stressors.	4.6
	g) cumulative impacts, where potential project impacts on MNES are in addition to existing impacts of other activities (including current or future developments by the proponent and other proponents in the region and vicinity)	4.6

RFI Item		Response Section
4.3	Include current maps and coordinates/shapefiles showing the total project footprint, total disturbance/direct and indirect impact areas, areas of habitat for MNES proposed to be retained.	4.1
4.4	Include details of any policy guidelines, relevant studies, surveys, or consultations with species experts/field specialists, which were not included in the referral or additional information provided in support of the referral.	4.3 TEC 4.4 Koala 4.5 Additional Species
5	**Avoidance, mitigation and management measures**	5
5.1	Demonstrate that you have applied the mitigation hierarchy and exhausted all options to avoid and mitigate harm to protected matters, before resorting to environmental offsets. In doing this, you must demonstrate that any avoidance or mitigation measures will provide ecological benefits to the species in the long-term. For example, on-site avoidance/conservation areas must be connected or provide connectivity opportunities for species in the broader landscape, and must include enduring mitigation of impacts from adjacent development.	5.1
5.2	Provide details (including a summary list or table) of avoidance and mitigation measures proposed to be undertaken to prevent or minimise impacts on protected matters (or their habitat) from the proposed action area, including:	
	a) a description of avoidance measures that have been considered and applied. For example, project site selection to avoid valuable habitat, micro-siting of infrastructure to avoid impacts on habitat on site, or avoidance of any activity that may indirectly impact on essential lifecycle processes for species.	5.2.1
	b) a description of proposed safeguards and mitigation measures to minimise and manage relevant impacts of the action, with reference to relevant statutory or policy documents at the Commonwealth and State level (e.g., Guideline: State Development Assessment Provisions (State Code 25))	5.2.2
	c) pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease.	5.2.3
	d) Information on any buffer zones between the construction footprint and remaining habitat in the referral area and adjacent to the site.	5.2.4
	e) measures to address the risk of MNES entering developed areas and becoming trapped/isolated without resources for shelter.	5.2.5
	f) ongoing management of direct and indirect impacts due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by negotiating various fence types	5.2.5

RFI Item		Response Section
	g) details of how speed reduction is to be achieved (e.g., traffic calming devices) and plans showing the locations of each of these features and the manner in which they will be implemented)	5.2.5
	h) information on safe road design and placement, including installation of crossing warning signs, wildlife threshold marking on road (include maps and imagery).	5.2.5
	i) the locations and size of any proposed fauna movement solutions, fire breaks, no go or buffer zones (including buffers between the construction footprint or remaining habitat in the referral area and adjacent to the site), and potential fencing, including: *i.* the location of any movement solutions, fire breaks, buffer zones, or fencing. *ii.* the characteristics of the fauna movement solutions, fire breaks, buffer zones and fencing, (i.e., height, length, wildlife proof measures etc) *iii.* whether the proposed measures, such as fencing will provide a wildlife barrier to/from/within the proposed action area. *iv.* When the movement solutions will be constructed and whether there will be periods with no connectivity *v.* The maintenance intervals of the above measures *vi.* The consistency of the above measures with relevant federal state, or industry guidelines	5.2.5
	j) a description of the environmental outcomes the measures are expected to achieve including details of any baseline data or proposed monitoring to demonstrate progress towards achieving these outcomes.	5.3
	k) information on the timing, frequency, and duration of the measures to be implemented	5.3
	l) an actual or estimated cost of the mitigation measures.	5.3
5.3	Provide an assessment of the predicted effectiveness of each proposed avoidance or mitigation measure, noting that the effectiveness of a particular measure is a reflection of confidence in the anticipated outcome. The assessment of effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome	5.3
5.4	For each measure proposed, indicate the: a) impacts that are being avoided and/or the significance of impacts being reduced through mitigation.	5.3

RFI Item		Response Section
	b) Scientific basis for conclusions being drawn	5.3
	c) an evidence-based likelihood of success/risk assessment	5.3
	d) responsible party	5.3
	e) milestones / performance / completion criteria	5.3
	f) proposed monitoring and evaluation program.	5.3
5.5	Describe any statutory or policy basis for the proposed measures, including reference to the SPRAT Database and relevant approved conservation advice, recovery plan or threat abatement plan, and a discussion on how the proposed measures are not inconsistent with relevant plans. For example, the National Recovery Plan for the Grey-Headed Flying Fox states an objective to: '*To improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats outlined in this plan on Grey-headed Flying-foxes through habitat identification, protection, restoration and monitoring*'. Please provide a discussion on how the proposed action is not inconsistent with relevant species' objectives or alternatively, how the proposed avoidance, mitigation/management and offsetting actions will compensate for any residual significant impacts, thereby ensuring consistency with the objective for relevant EPBC Act species.	5.3
5.6	All proposed measures must consider the 'S.M.A.R.T' principle: S – Specific (species-specific objectives, methods, outcomes, and repeatability) M – Measurable (baseline information, quantifiable, auditable) A – Achievable (timeframes, financial and human resources) R – Relevant (conservation advice, recovery plans, threat abatement plans) T – Time-bound (set implementation, performance and completion timeframes).	5.3
6	**Proposed Offsets**	**6**

RFI Item		Response Section
	1. Offset Proposal – The Offset Proposal must provide detail about the proposed offset site or sites including baseline survey information, habitat or vegetation quality scores, how the offset will be managed, and evidence that the protected matter is present or uses the offset site. The Offset Proposal must demonstrate how the proposed offset is suitable and meets the principles of the EPBC Offsets Policy and must include sufficient information for the department to assess it using the EPBC Offsets Assessment Guide. 2. Offset Management Plan (OMP) - The OMP supports the Offset Proposal and must detail all the management activities to be undertaken at the offset site including setting environmental objectives, milestones, monitoring and reporting measures. Management plans and activities must be targeted towards the specific plant, animal, ecological community, or place (protected matter) that is being offset. If there is more than one offset site, then a separate OMP must be prepared for each site	6
7	**Habitat Quality Assessment**	Section 4
8	**Economic and Social Matters**	**7**
If not previously provided in the referral documentation, the preliminary documentation 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.	7.1
	Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.	7.1
	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.	7.2
	Provide details of any consultation with Indigenous stakeholders.	7.3
9	**Ecologically Sustainable Development**	**8**
If not previously provided in the referral documentation, the preliminary documentation must:		
9	Provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act, which are as follows: impacts that are being avoided and/or the significance of impacts being reduced through mitigation. a) decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.	8

RFI Item		Response Section
	b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.	8
	c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	8
	d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making	8
10	**Environmental record of the person proposing to take the action**	**9**
Include details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:		
10.1	The person proposing to take the action	10
10.2	for an action for which a person has applied for a permit, the person making the application;	10
10.3	if the person is a body corporate—the history of its executive officers in relation to environmental matters; and	10
10.4	if the person is a body corporate that is a subsidiary of another body or company (the parent body)—the history in relation to environmental matters of the parent body and its executive officers.	10
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.	
Attachment B – Information requirements for EBPC Act offset proposals and offset management plans		
1	**Offset Proposal requirements**	
Further to Section 6 of the PD request, the offset proposal must include, but not be limited to, the following:		
1.1	A detailed project description, including a site description and how and to what extent your action will impact on protected matters.	Offset not yet resolved

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

RFI Item		Response Section
	i) The methodology, with justification and supporting evidence, used to inform the inputs of the Offsets Assessment Guide in relation to the offset site for each OFFICIAL Department of Climate Change, Energy, the Environment and Water OFFICIAL 17 relevant MNES, including: a. total area of habitat (in hectares) b. habitat quality (as discussed in section 8) c. time over which loss is averted (max. 20 years) d. time until ecological benefit e. risk of loss (%) without offset f. risk of loss (%) with offset g. confidence in result (%)	
	j) Details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the potential offset area/s against development incompatible with conservation.	Offset not yet resolved
1.4	The Offset Proposal must demonstrate how the offset meets the principles of the EPBC Offsets Policy and EPBC Offsets Assessment Guide to inform the Minister's decision on whether or not the project should be approved under the EPBC Act.	Offset not yet resolved
1.5	Details of the actual or estimated cost of the offset proposal including costs associated with proposed mitigation and management measures onsite.	Offset not yet resolved
2	**Offset Management Plan (OMP) requirements**	
2.1	A description of the proposed offset site(s) including location, size, condition, existing and future tenure, and relevant ecological/species values present and surrounding land uses.	Offset not yet resolved
2.2	Maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g., physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant MNES that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares).	Offset not yet resolved
2.3	Baseline survey information showing MNES presence and the extent and quality of the respective habitat(s) at the proposed offset site(s) in accordance with the relevant survey guidelines or using a scientifically robust and repeatable methodology	Offset not yet resolved
2.4	Summarised details of the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s.	Offset not yet resolved
2.5	Information about how the proposed offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant MNES. This should include information about how the proposed offset/s area contributes to any state and/or regional plan/s for the conservation of the protected matter.	Offset not yet resolved

RFI Item		Response Section
2.6	Mechanisms for protection, for at least the full duration of the impact, under a conservation covenant or otherwise accepted method, noting that protection mechanisms for permanent impacts should continue in perpetuity.	
2.7	Completion criteria and, if necessary, performance targets that evidence protection or improvement of EPBC Act listed communities, species and their habitat. For the purpose of the plan: a) completion criteria are longer term time-bound values, specified for measurable parameters, that if attained and maintained ensure the plan's environmental objectives are achieved; and For example: 'By Year 20, the approval holder must reduce non-native plant cover to within 5% of the benchmark value associated with each Regional Ecosystem.'	Offset not yet resolved
	b) performance targets are time-bound short- and medium-term targets, for management interventions and environmental condition, that are used to monitor, evaluate, review and improve the effectiveness of the plan to offset impacts. For example: 'By Year 10, the approval holder must reduce non-native plant cover to within 10% of the benchmark value associated with each Regional Ecosystem.'	Offset not yet resolved
2.8	The plan includes management measures that will protect or improve EPBC Act listed threatened ecological communities and/or species and their habitat. Each management measure: a) is specifically linked to the attribute of the protected matter for which the management measure applies;	Offset not yet resolved
	b) has timeframes for implementation;	Offset not yet resolved
	c) is described sufficiently to avoid ambiguity and to inform plan implementation;	Offset not yet resolved
	d) is related to attaining/maintaining completion criteria and/or performance targets; and	Offset not yet resolved
	e) is derived from recognised principles, practice, or guidelines, and is justified - technically, scientifically and legally (e.g. by recommendation in a national recovery plan) – as an effective and appropriate measure to attain and/or maintain the plan's completion criteria and/or performance targets. Management activities must be targeted towards the needs of the protected matter that is offset, and must align with the recovery objectives for the species as identified in relevant National Recovery Plans or Conservation Advices.	

RFI Item		Response Section
2.9	The plan identifies and manages uncertainty. To this end the plan specifies: is specifically linked to the attribute of the protected matter for which the management measure applies; a) key data/information used to formulate the plan;	Offset not yet resolved
	b) the limitations and/or uncertainty associated with the use of that data/information;	Offset not yet resolved
	c) the risks that limitation and/or uncertainty represents for plan failure; and	Offset not yet resolved
	d) how limitations and/or uncertainty, and associated risks, are mitigated during plan implementation. For example, where a margin of safety is applied to management measures until uncertainty is reduced to an acceptable level or performance targets/completion criteria are attained/maintained.	Offset not yet resolved
2.10	The plan assesses the risk of failure to achieve the plan's performance targets and/or completion criteria. To this end the plan: a) states the plan's performance targets and/or completion criteria;	Offset not yet resolved
	b) identifies events or circumstances that prejudice attainment/maintenance of performance targets and/or completion criteria. The events or circumstances must address scientific/ecological uncertainty, stochastic events and legal/land use planning factors that may represent risks;	Offset not yet resolved
	c) includes a qualitative assessment of the likelihood and consequence of those events or circumstances, and the residual risk of failure to achieve those criteria due to identified events or circumstances (assuming management measures will be implemented);	Offset not yet resolved
	d) characterises risk as low, medium, high or severe, and derived from likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical); and	Offset not yet resolved
	e) outlines how consequence, likelihood and risk level for each risk have been determined.	Offset not yet resolved
2.11	The plan manages the risk of failure to achieve performance targets and/or completion criteria by: a) specifying management measures that will be implemented to attain/maintain the completion criteria and/or performance targets;	Offset not yet resolved

RFI Item		Response Section
	b) enhancing monitoring and management measures for high-risk events or circumstances, thereby providing a 'margin of safety' to detect, avoid or mitigate the likelihood and/or impacts of the event or circumstance;	Offset not yet resolved
	c) specifying measurable events or circumstances (management triggers) that detect actual or potential issues in a timely manner to avoid, minimise or mitigate adverse impacts;	Offset not yet resolved
	d) ensuring the monitoring program includes activities to detect management triggers, and explains how monitoring activities may inform the selection and implementation of corrective actions;	Offset not yet resolved
	e) specifying methods to be used to determine whether the management trigger is project attributable;	Offset not yet resolved
	f) specifying effective and appropriate corrective actions that may be implemented if a management trigger is realised; and	Offset not yet resolved
	g) monitoring the effectiveness of corrective actions and implementing appropriate responses in the event corrective actions are not effective.	Offset not yet resolved
2.12	The plan assesses the risk of failure to achieve the plan's performance targets and/or completion criteria. To this end the plan: a) states the plan's performance targets and/or completion criteria;	Offset not yet resolved
	b) identifies events or circumstances that prejudice attainment/maintenance of performance targets and/or completion criteria. The events or circumstances must address scientific/ecological uncertainty, stochastic events and legal/land use planning factors that may represent risks;	Offset not yet resolved
	c) identifies events or circumstances that prejudice attainment/maintenance of performance targets and/or completion criteria. The events or circumstances must address scientific/ecological uncertainty, stochastic events and legal/land use planning factors that may represent risks;	Offset not yet resolved
	d) characterises risk as low, medium, high or severe, and derived from likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical); and	Offset not yet resolved
	e) outlines how consequence, likelihood and risk level for each risk have been determined.	Offset not yet resolved

RFI Item		Response Section
2.13	The plan describes the monitoring methods that will be implemented, and:	
	a) demonstrates the relevance of the monitoring methods to the protection of the relevant aspect of the protected matter(s) for which the offset is implemented;	Offset not yet resolved
	b) includes quantitative (e.g. on-ground survey results) and qualitative baseline data (e.g. photo-point monitoring sites) that establish the start quality/condition of the environment and which can be used to measure performance against;	Offset not yet resolved
	c) describes the sampling strategy (including monitoring area, site selection and sampling intensity over space and time) and statistical analyses to be employed;	Offset not yet resolved
	d) justifies the sampling strategy/monitoring methods, including through:	Offset not yet resolved
	e) an assessment of effectiveness and constraints to use;	Offset not yet resolved
	f) capacity to detect change in environmental condition due to management interventions;	Offset not yet resolved
	g) capacity to demonstrate attainment of performance targets and/or completion criteria; and	Offset not yet resolved
	h) the statistical power of the strategy/method.	Offset not yet resolved
	i) commits to engage appropriately qualified experts to design and conduct monitoring and survey activities, and analyse monitoring results;	Offset not yet resolved
	j) accounts for seasonal/climatic variability; and	Offset not yet resolved
	k) details the location, nature and number of monitoring sites, including benchmark/reference sites to evaluate management performance.	Offset not yet resolved

RFI Item		Response Section
2.14	The plan includes commitments to report on plan implementation and success as well as opportunities for improvement. This is achieved by: a) if the project is approved, identifying relevant reporting obligations under the EPBC approval, or otherwise proposing appropriate regular reporting intervals, objectives and methods;	Offset not yet resolved
	b) specifying how plan/strategy implementation will be reported in accordance with those obligations;	Offset not yet resolved
	c) including a reporting template specifying key risk management, management measures, monitoring and adaptive implementation outcomes for the reporting period; and	Offset not yet resolved
	d) including a schedule and triggers for reporting types (e.g. annual compliance, incident, non-compliance, contingency)	Offset not yet resolved

2. Description of the Action

Item two (2) of PD Request seeks additional information outlining description of action 2.1, 2.2, 2.3, and 2.4. A complete response to Item 2 is provided following.

2.1. Description of the proposed action

Item 2.1 (a) of PD Request requests;

a) *A description of all components of the proposed action (such as pre construction, construction and operational), including the staging, sequencing, duration and timing.*

The Proposed Action involves the upgrade and extension of the southern end of New Beith Road, Flagstone. The site is centred on the coordinates – 27.76894, 152.93690 (refer **Figure A1** and **A2** for site context and aerial imagery). The total impact area incorporating the works extent is approximately 23.3 hectares (ha) (18.9 ha + 4.4 ha) and 3.2 kilometres (km) in length. The referral area is inclusive of a 100 m buffer from the edge of batters totalling 67.1 ha.

The proposed action is for an upgrade to New Beith Road to deliver a transport corridor essential to servicing multiple GFPDA development projects and providing a critical link to the north portion of Logan via Pub Lane and Greenbank Arterial Road and other major suburban centres such as Springfield. EDQ has undertaken considerable planning investigations into the proposed action, and intimately identified the site for a 4 lane Urban Arterial Road with an ultimate construction consisting of an approximately 33 m wide corridor that defines the proposed action. In the interim, until a 4-lane road is required, a 2-lane urban Arterial Road will be constructed within the same footprint. The connection is essential for the existing approvals adjoining the site, and also required for emergency access for both emergency services and the growing population given there is currently only one main entry point to the PDA via Homestead Drive.

As shown in **Plan A3** the site is surrounded by various developments with existing EPBC Act approvals, and many currently under assessment. The action aligns with an existing road that is compacted road base in the north and cleared fire trail in the south, and the surrounding area is historically cleared and modified. The development will require the clearing of vegetation to provide the footprint required for the road and associated batters.

The Proposed Action is expected to constitute the following actions;

- Removal of vegetation within the Site for development footprint of the Proposed Action.
- Civil and associated bulk earthworks to create level construction footprint.
- Waterway crossings to ensure connectivity of waterway and wildlife corridors within and external to the site.
- Stormwater culverts and drainage, and
- Provision of watermains, electrical, streetlights and other associated infrastructure.

An outline of the components of the Proposed Action provided by the Proponent is shown in **Table A2**. The Proposed Action is for the purpose of a road with external developments occurring directly external to the site. As such, buffer areas beyond road batters are not practical, however, waterway corridors will be retained, protected, and enhanced incorporating fauna sensitive design, fauna infrastructure and additional wildlife crossings/poles interspersed down the length of the road.

The Proposed Action represents an infill development utilising an existing road and track, upgrading, and providing an Urban Arterial Road that will be a critical link north south for the GFPDA. Surrounding development will link to the State-controlled Road network (Proposed Action) and will provide increased capacity (when compared with local roads) to manage the population growth of the locality. The Urban Arterial Road will result in less hardstand for roads in other locations of the GFPDA with higher ecological significance. Where the Site traverses important ecological features (waterway corridors) these locations will be constructed in a way that promotes fauna passage across these potential barriers. Wildlife management infrastructure approaches to these matters are described in **Section 5**.

The traffic and feasibility investigation (**Appendix A3**) for the Proposed Action has identified the development;

> "*will deliver a direct benefit 83 FTE jobs and $10.6 million during construction. The catalytic benefit of the road has the potential to unlock in excess of $4,100 million expenditure impact and 37,000 jobs during the construction phase for ultimate development build out. Sustained operational benefits includes approximately $2,200 million GSP contribution and 27,000 permanent jobs, subject to accessibility constrains being resolved*" (Urbis. 2019). Refer **Appendix A3** for feasibility reporting.

Furthermore, EDQ (Queensland Government) supports the necessary works to complete New Beith Road. **Appendix A4** highlights the roads importance for transit connections to the northern part of Logan and other major nodal points in the PDA. Emergency access for both emergency services and the growing population within the GFPDA is a challenge which the Proposed Action is helping to solve.

The Proposed Action will enhance traffic capacity and safety through new or improved intersections, street lighting and pedestrian cyclist facilities where applicable. The new road will accommodate future public transport for the community and support an expansion of the current bus services, subject to State Government planning. Further, the new road will integrate active transport to connect to an extensive pedestrian and cycle path proposed in the GFUDAPS.

A description of components of the Proposed Action including preconstruction, construction and operational, including the staging, sequencing, duration and timing are provided by the Proponent in **Table A2**.

Table A2: Proposed Action Staging

Construction Phase	Activities	Staging	Sequencing	Duration	Timing
Preconstruction	Road Functional (interim Ultimate)	From Flagstone Drive connection to northern boundary for Flagstone PDA (Wilson's Land)	Road Functional Designs	2 months	State Approval November 2025
	Detailed Design (Interim Only)		Detailed Designs earthworks, stormwater culverts and drainage, water mains and electrical/streetlighting, Streetscape	6 months	Approval November 2025
Construction	2-Lane Interim Roadway including Crossings	From Flagstone Drive connection to northern boundary for Flagstone PDA (Wilson's Land)	Bulk Earthworks, culvert crossings, Stormwater Drainage, pavement, water main, electrical streetlighting, Streetscape	18 months	Commencement January 2026 and 18 month anticipated construction program
Operational	On Maintenance and Open to Public	From Flagstone Drive connection to northern boundary for Flagstone PDA (Wilson's Land)	Defects Liability Period	12 months	Works completed and operational by July 2027 Defects Liability Period ends July 2028

Timeframes and Staging

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

In response to item 2.1 (b), The Proponent has provided responses to expected timing in **Table A2** including the commencement date for preconstruction, construction and operational stages, with the duration, sequencing and timing also included in **Table A2** above.

2.3. The location, boundaries and site extent

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

The development is clearly displayed in mapping included in **Plan A1**, showing the location, extent and size in hectares. The footprint, disturbance/impact footprint and the surrounding land is visually shown in **Plan**

A1. The Site has been subject to substantial historical disturbance including clearing for rural pursuits on land surrounding the road works extent. Additionally, clearing has occurred in the footprint of The Proposed Action for the current road/track (refer **Plan A2**).

Field surveys confirmed the road reserve consists of a gravel and paved road for the northern portion and cleared tracks and fire trails through the southern locality. Surrounding vegetation has been impacted by historical clearing and ongoing disturbances including dust, noise and emissions from vehicle use and other illegal uses (vandalism, four-wheel driving and offroad vehicle damage).

The site is positioned within the GFPDA (refer **Figure A3 – Greater Flagstone Priority Development Area Zoning)** and is mapped as an Arterial Road with residential land use bordering the site to the east and west. Recently constructed residential development occurs to the north of the site with the landform predominately residential housing communities with limited vegetation and habitat connections to the south. Furthermore, the surrounding locality is undergoing significant land use change, with several EPBC Act approvals and assessments for development adjoining the site, including Flagstone City (to the south), Tarnbrae and New Beith (adjoining the road/development extent), Olson Road New Beith (to the east), Undullah (to the southwest) and Greenbank to the (northeast). The majority of adjoining developments have been determined a controlled action for the purposes of the EPBC Act, except for areas where development is assumed to predate the listing of the Koala (refer **Plan A3**).

Direct Impact

The proposed action involves the upgrade of the existing New Beith Road reserve for an approximate length of 3.2 km. The referral area includes the works extent road alignment, batters, a construction buffer of 5 m from the road batters, for an area of existing road 4.4 ha and balance18.9 ha (direct impact). The referral area includes a 100 m buffer area either side of the road works footprint, comprising a total of 67.1 ha balance area summing to a total referral area of 90.4 ha area.

Direct impact is expected to the development footprint including batters and a 5 m construction buffer. While the site is currently utilised as an unsealed road and subject to noise, dust, light and edge effects, the construction of new road will result in direct impact during construction phase as well as ongoing and future impacts discussed in **Section 4.**

Facilitated Impact

The GFPDA is existing and includes multiple EPBC Act approvals and assessments for residential developments. Edge effects, noise, light spill, vehicle access or other associated activities, may impact adjoining values but will be largely mitigating, noting adjoining development underway or proposed**.** Refer to **Plan A1** for location and scope and direct impact to the referral area.

Table A3 provides details specific to the impact area. The plan for the Proposed Action is shown in **Plan A1**.

Table A3: Details on the Impact Area

Location	– 27.76894, 152.93690
Referral Area	90.40 ha
Impact Area	18.9 ha direct impact plus 4.4 ha existing road
State NCA 1992	Partially within High-Risk Area for Protected Plants
State VMA 1999	Category C (High Value Regrowth) Category B (Remnant Vegetation) Category X (Non-remnant) Essential habitat for *Phascolarctos cinereus* (Koala), and watercourses
State Planning Policy	MSES – Wildlife habitat (special least concern animal) MSES – Wildlife habitat (koala habitat areas – core) MSES – Regulated vegetation (category C) MSES – Regulated vegetation (essential habitat) MSES – Regulated vegetation (intersecting a watercourse)
State Koala Habitat	Koala Habitat Area (core) (KHA)
State Fisheries 1994	Queensland waterways for waterway barrier works • 1 – Low • 2 – High
LGA	Logan City Council

A1. PROPOSED DEVELOPMENT

Notes:
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LEGEND

- Qld DCDB
- Referral Area [90.4 ha]
- Direct impact area excluding existing cleared track [18.9 ha]

Engineering Detail

- Road Design
- Linemarking Design
- Cycleway Design
- Footpath Design
- Batters

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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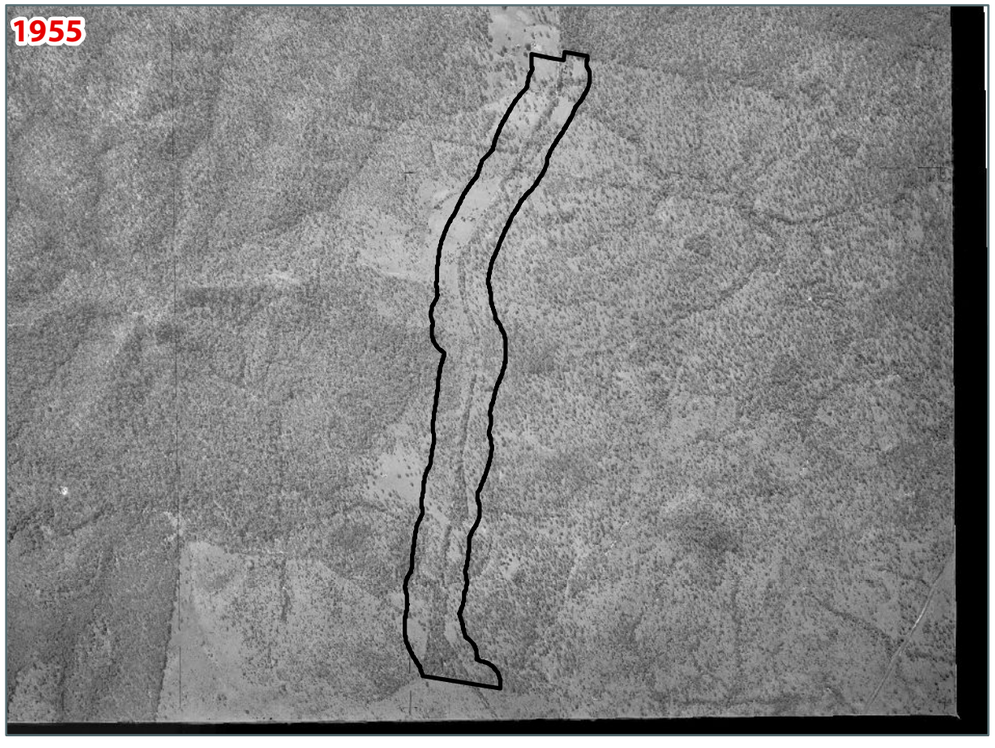
New Beith Road

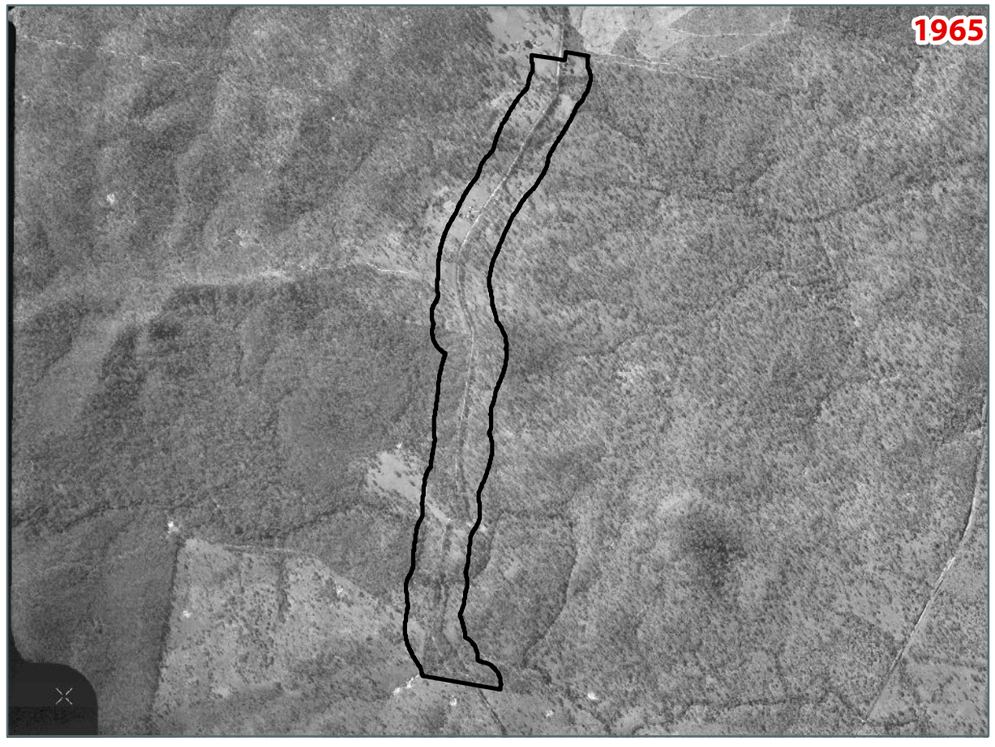
Address / RPD: *New Beith, QLD*

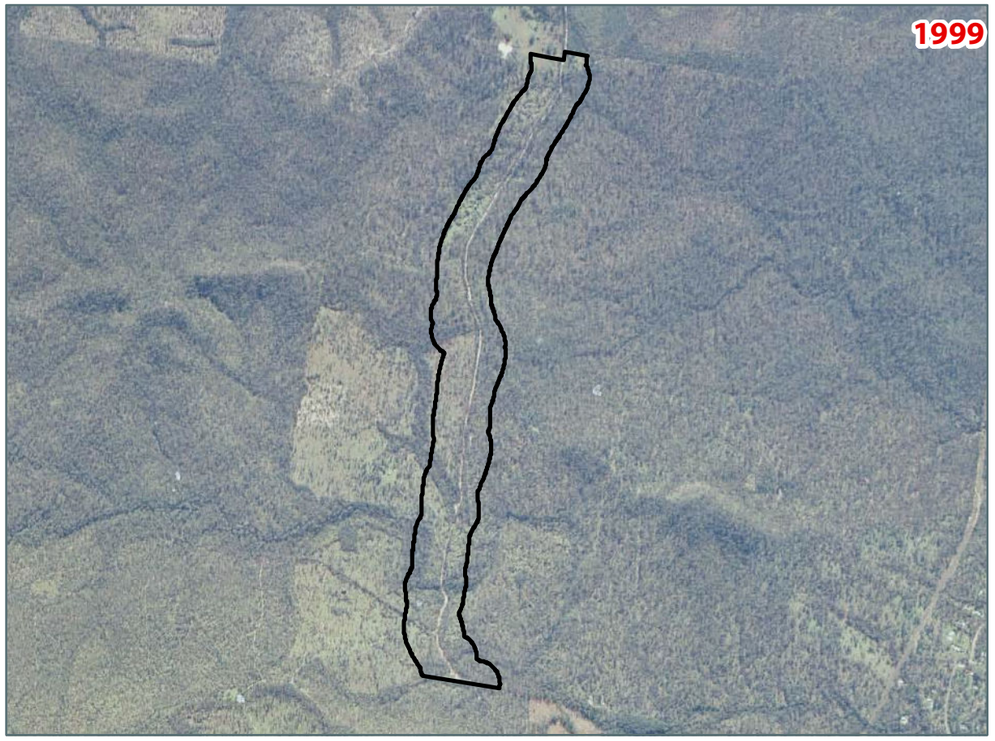
10/07/2025

8418 E A1 NBR Proposed Development A

A2. HISTORICAL AERIAL IMAGERY







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LEGEND

Referral Area

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New Beith Road

0 1 km

N

Transverse Mercator
GDA 2020 | Zone 56

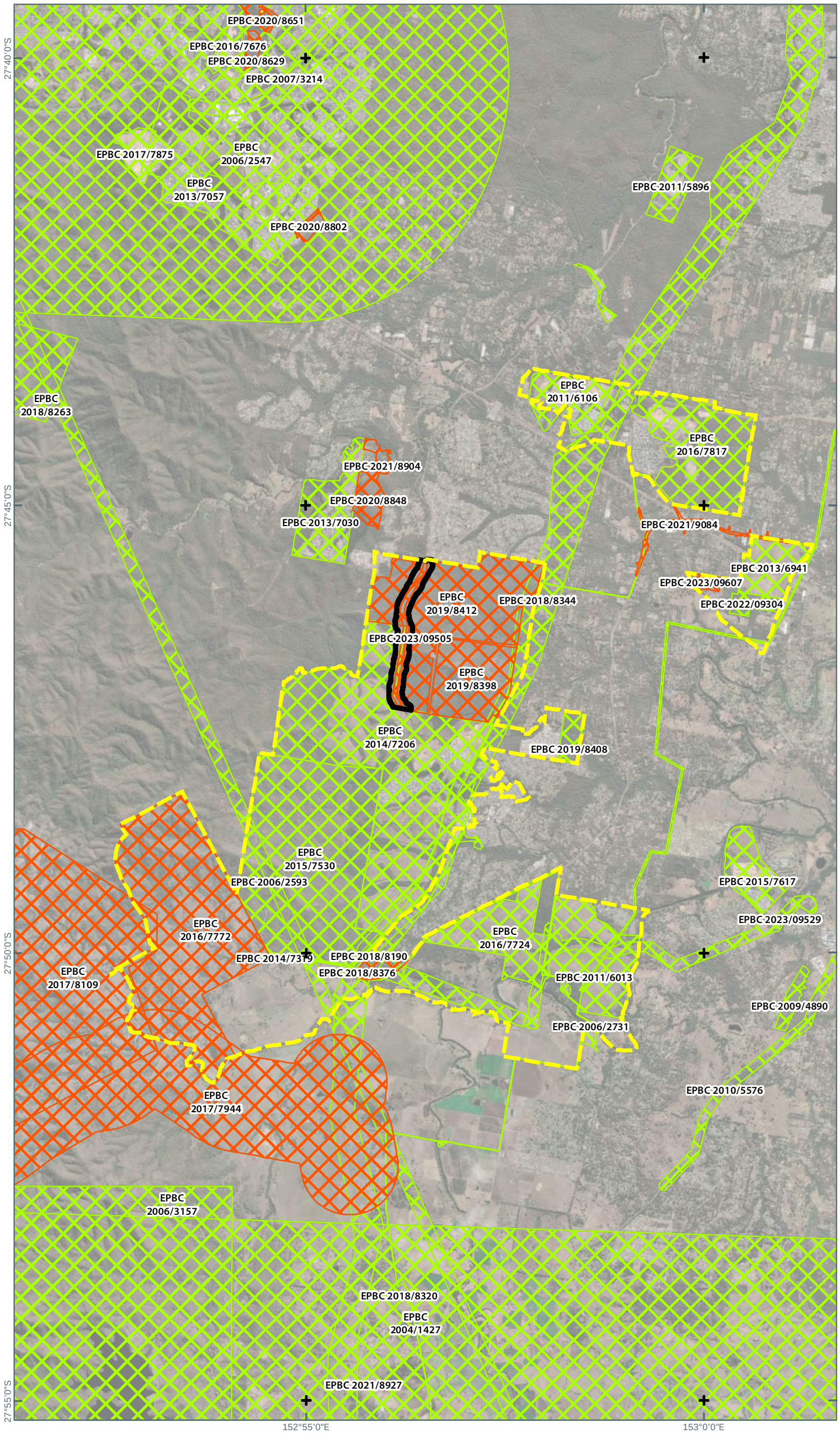
1:30,000 @ A3

Address / RPD: *New Beith, QLD*

10/07/2025

8418 E A2 NBR Historical Imagery A

A3. EPBC DETERMINATIONS AND APPROVALS



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LEGEND

- Referral Area
- Greater Flagstone Priority Development Area

EPBC Referrals

- EPBC Determination
- EPBC Referral Assessment

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 km

1:80,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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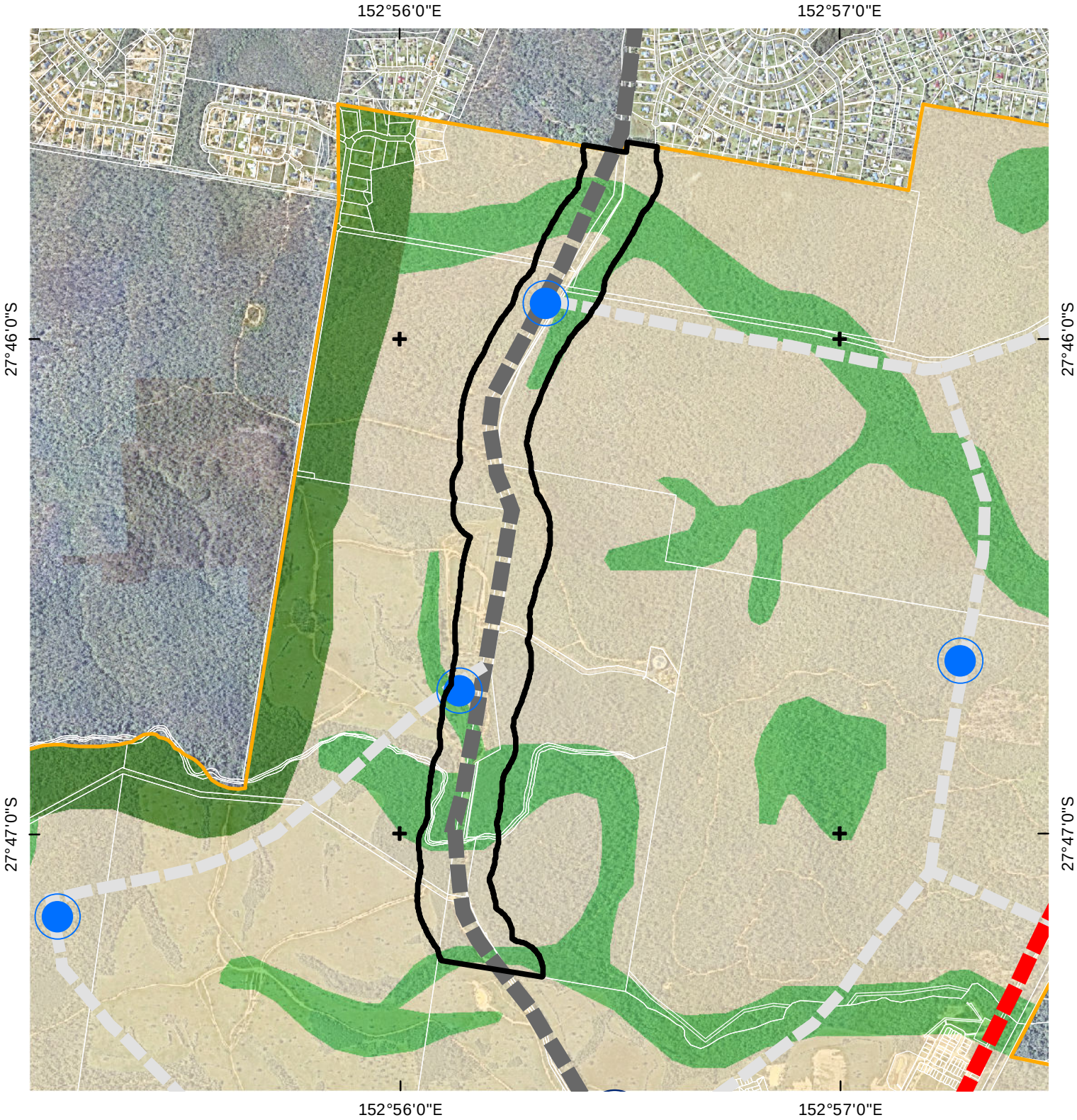
10/07/2025

8418 E A3 NBR EPBC Determinations A



LEGEND

- Qld DCDB
- Referral Area
- Greater Flagstone Boundary

Land Use Zones

- Conservation
- Greenspace
- Industry & Business
- Major Centre
- Urban Living
- Utilities

Centres

- District Centre
- Neighbourhood Centre
- Potential Rail Station

Roads and Rail

- Primary Road
- Rail
- Regional Road

Figure A3

Greater Flagstone PDA - Zoning

CLIENT

PEET Flagstone City Pty Ltd

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:20,000

0 100 200 300 400 500 m

N

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FILE REFERENCE
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DATE 10/07/2025

2.4. Site Access Roads and Shared Infrastructure

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

The proposed road upgrades will connect to existing sealed roads in the north, and future roads linking south as shown in **Figure A3** of this report. This referral is for the development as outlined in **Plan A1** and does not include any other future roads. The Proposed Action will provide an Urban Arterial Road providing a critical link from the PDA to the northern part of Logan via Pub Lane and Greenbank Arterial Road and onto other major nodal points including Springfield.

The PDA contains various developments under EPBC Act assessment and decision stage (**Plan A3**) including Tarnbrae, New Beith EPBC2019/8412 directly to the east and west, Flagstone City EPBC2014/7206 to the west and south, and Round Mountain 2019/8398 further to the east. These developments will utilise the proposed road in some form for access and servicing arrangements, however, are not the same Proposed Action nor facilitated by the Proposed Action.

In 2020, more than 1,000 residents petitioned the Qld State Government for the construction of New Beith Road, the second access point into Greater Flagstone. Greater Flagstone and many of the surrounding suburbs maintain a single point of access with a single lane rural standard road servicing the largest planned urban release areas in Australia. This single point of access presents safety concerns with regards to congestion and alternative access routes in the event of an emergency such as flood or fire. On 28 July 2021, the Deputy Premier announced $37m in Catalyst funding for New Beith Road to be constructed in Greater Flagstone to alleviate resident concerns around a secondary access. New Beith Road is obtaining all necessary approvals with the outstanding milestone being a Federal Government EPBC approval. The overarching Approval Number through QLD Government is DEV2012/403 and DEV2012/403/61 approval reference for Road Functional Application. Further information can be found in **Appendix A5 – Flagstone New Beith Road Connection, Economic Memorandum**.

2.5. Project Footprint

Item 2.2 of the PD Request asks for ***'information that delineates the footprint and activities of the proposed action from adjacent proposed or existing developments'.***

In response to this request, **Plan A1** has been prepared to identify the proposed actions footprint, clearly displaying the proposed action extent for impact area and referral area from other surrounding development. Additionally **Plan A3** shows other surrounding development currently under EPBC Act assessment or having already gained EPBC Act approval.

2.6. Intended Land Uses

Item 2.3 of the PD Request asks to ***'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 intended party that would be responsible for future management activities'.

The site is currently utilised as an unsealed road/track/fire trail. The proposed action is for the construction and sealing of a regional network road that will connect north/south to future residential development in the GFPDA. The land use will continue to be for the use of road for transport network infrastructure.

The site itself has been subject to substantial historical disturbance including clearing for rural pursuits and clearing in the existing road reserve (**Plan A2**). Field survey confirmed the current road reserve consists of an existing gravel and paved road for the northern portion and cleared tracks and fire trails through the southern portion. Surrounding vegetation has been impacted by clearing and ongoing disturbances including dust, noise and emissions from vehicle use and other illegal uses (vandalism, four-wheel driving and offroad vehicle damage).

Due to the ongoing use of the land for road, further supported by the Queensland Government expectation of the land being developed for regional road and transport networks, as well as adjoining approved developments and other areas under assessment, areas of conservation will not be provided for within the development footprint. Waterway crossings will be appropriately constructed to allow for fauna movement and wildlife corridors within the locality. Additionally, conservation areas adjoining a regional network road is an inappropriate co-location of land use, and rather fauna infrastructure will be integrated into the future waterway corridor crossings to allow the safe passage of fauna throughout the locality.

The Proposed Action is in accordance with the Queensland Governments' expectation for the development of the New Beith and Flagstone locality to accommodate the future infrastructure required of the locality. QLD Government will be responsible for future management of the road network.

2.7. Land use Planning Context and Environmental Assessments

Item 2.4 of the PD Request asks for ***'details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that applies or is likely to apply to the proposed action. Details should include (but are not limited to):***

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

The development is not assessable against the Local Government Planning Scheme of LCC due to the location of the site in the GFPDA, a declared Priority Development Area (PDA) by the Queensland Government. The Economic Development Act 2012 (EDA) facilitates economic development and development for community purposes, as well as the declaration of land for PDA's, and the assessment process is managed by the EDA providing a streamlined process with no referral to the state, however, state issues are still considered.

The planning scheme relevant to the site is GFUDADS. The Proposed Action is identified as a regional road on various maps of the GFUDADS linking and joining surrounding centres, living zones and industry and business (**Figure A3**).

b. Application/ approval numbers for existing applications where relevant;

The Overarching Approval Number is DEV2012/403 and Road Functional Application Number is DEV2012/403/61

c. Obtained approvals or additional approvals that are required.

This EPBC Act approval and operational works are the final approvals required.

3. Description of the Environment and Matters of National Significance

This section responds to Item 3 of the PD request that requires the proponent to describe the environment affected by, and surrounding the proposed action area, over the short and long time and responds to 3.1, 3.2, 3.3, 3.4, 3.5 of the PD Request.

3.1. Previous and Current Land Use

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

3.1.1. Site Context and Connectivity

The areas of investigation for this ecological assessment include:

- Referral area is centred on coordinates – 27.76894, 152.93690 with a referral area inclusive of a 100 m buffer.
- The works extent totals 23.3 ha (18.9 ha direct impact and 4.4 ha existing road), the area of referral not including works extent is 67.1 ha, and total referral area and works extent 90.4 ha.
- Locality – the extent of the 5 km radius database searches of the referral area.

The context of the site can be seen in **Figure A1** and is located within a peri urban area of the GFPDA. Additionally, the site is identified within the development scheme as a transport network for regional road. The road has been identified on the Greater Flagstone DCOP – Transport (road) Trunk Infrastructure Plans and will provide a bus route, significantly reducing the need for residents to travel longer distances externally to the PDA. The Proposed Action has been included in State Government infrastructure planning dating back to 2012 and is embedded into all existing approvals already granted, inclusive of those which have obtained EPBC Act sign off (**Plan A3**).

The site is bound by predominantly Regulated (Remnant) vegetation to the east and south, non-regulated vegetation along the western boundary and south, and small portions of Regulated (High-value regrowth vegetation) central/south. Presently there is 39.03% of regulated vegetation cover (28.53% remnant, 10.50% regrowth) within 2 km of the site. The balance (60.97%) comprises modified or cleared vegetation types.

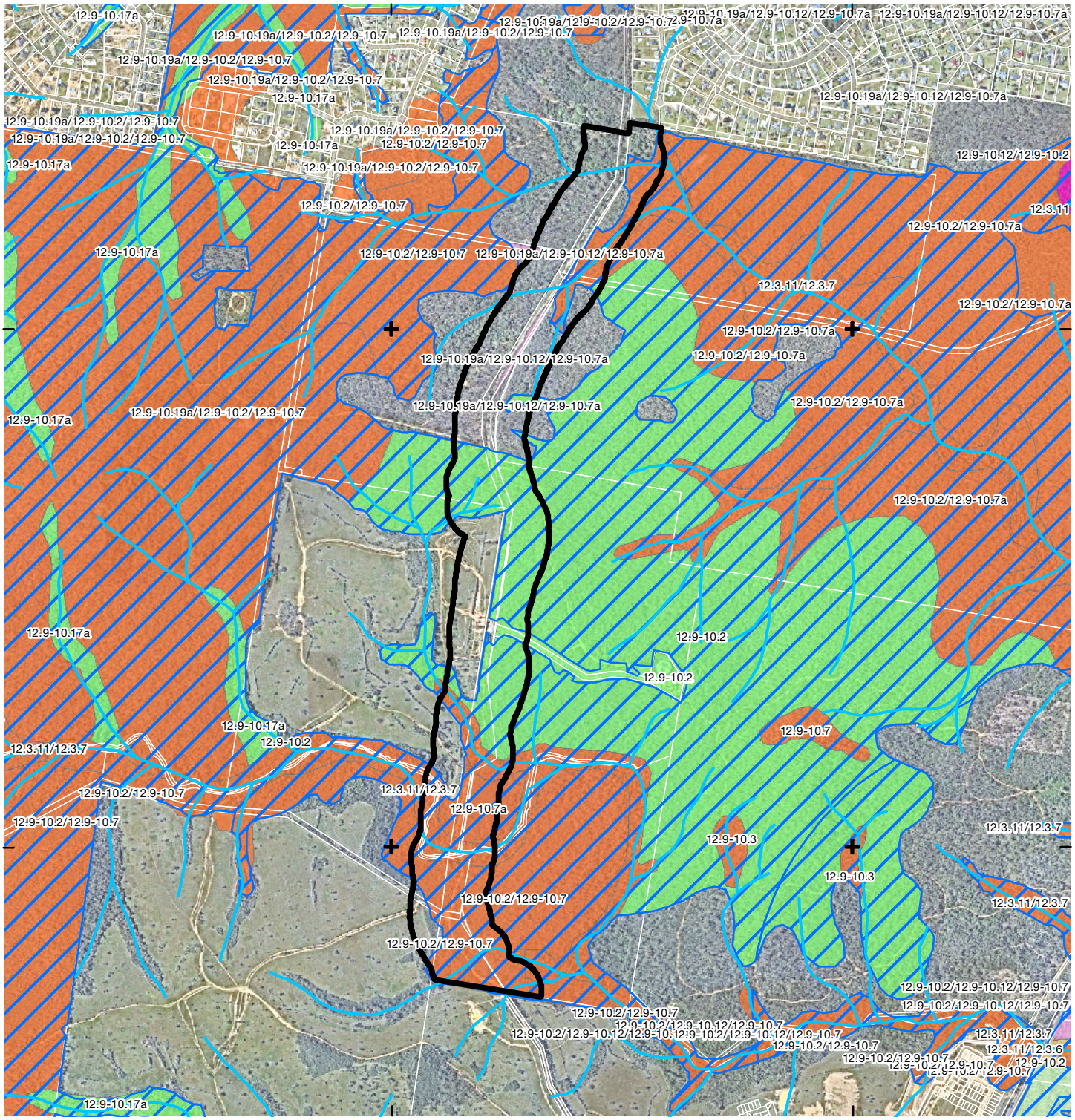
Connectiveness of vegetative cover with the surrounds is shown in **Figure A4** and shows the site connecting the urban surrounds to the north, with open cleared paddocks in the east, west and south. Importantly in context of existing State mapped native habitat it is important to consider future connectiveness in the surrounding landscape based on approved development (**Plan A3)** and the land use intention of the locality

as a PDA by the Queensland Government (**Figure A3)** both of which are not reflected in Regulated Vegetation mapping.

3.1.2. Past and Current Land Use

The site is located in the GFPDA and the southern locality of LCC. The area is currently undergoing significant change in line with the intention and vision of GFUDAPS. The referral area and surrounding land have previously been utilised for primarily agricultural and grazing land use, with broad scale clearing and cleared tracks evident onsite in the earliest aerial mapping from 1955. Historical aerial mapping is shown in **Table A4** and **Plan A2**.

Newer residential subdivisions are located surrounding the site in the suburbs of Flagstone, South Maclean and North Maclean. The site will provide essential transport linkages in the area contributing to major road networks linking centres, neighbours, external road networks, accommodating a range of users. The site is currently utilised as an unsealed road and track adjoining larger rural residential parcels of land and the existing land use for road will continue for the Proposed Action.



LEGEND

- Qld DCDB
- Referral Area
- VM Watercourses
- VM Essential Habitat
- VM Wetland

Vegetation Management Regional Ecosystems Map

- Category A or B area containing endangered regional ecosystems
- Category A or B area containing of concern regional ecosystems
- Category A or B area that is a least concern regional ecosystem
- 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 A4

Vegetation Management Regional Ecosystem Map

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:20,000

0 100 200 300 400 500 m

N

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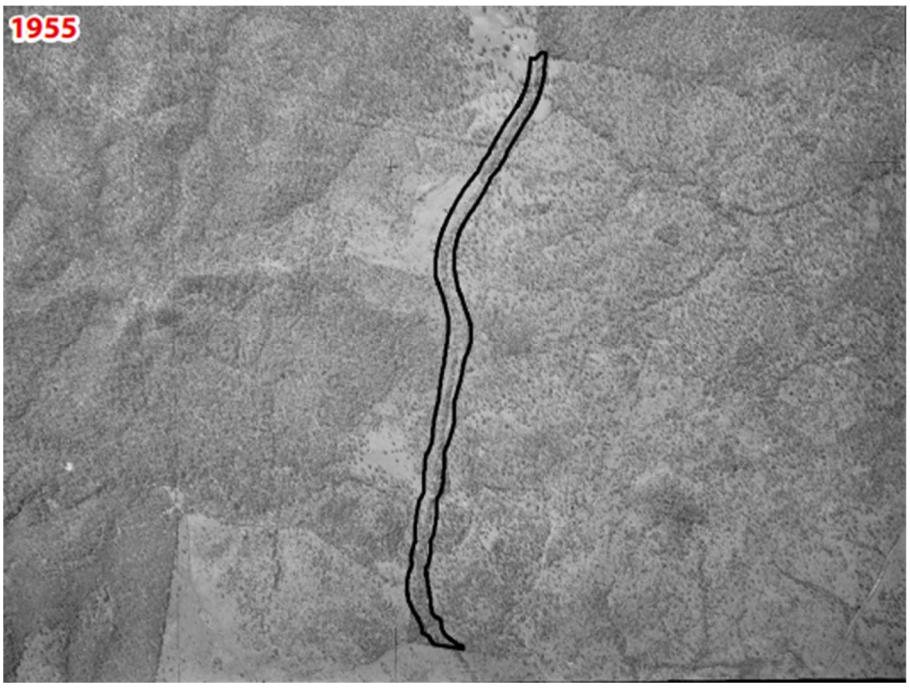
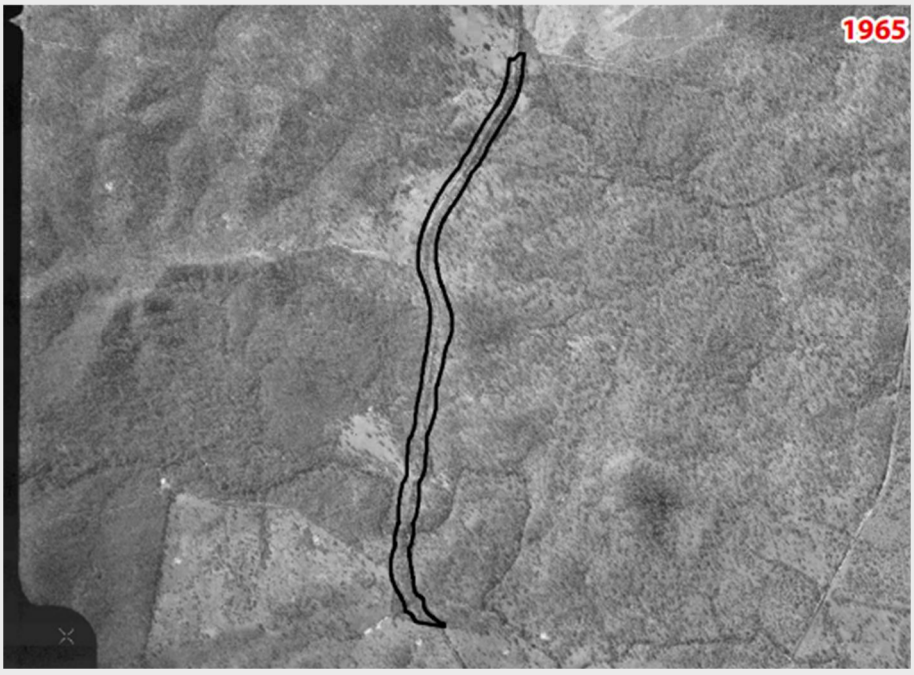
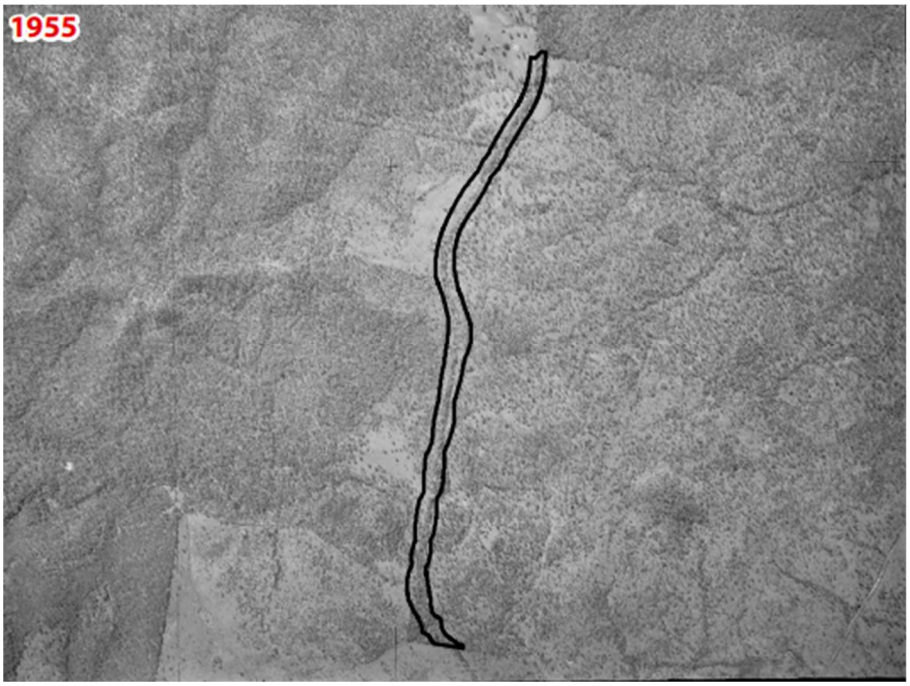
FILE REFERENCE
8418 E Figure 4 NBR VMRE A

DATE 10/07/2025

Table A4: Historical Aerial Mapping

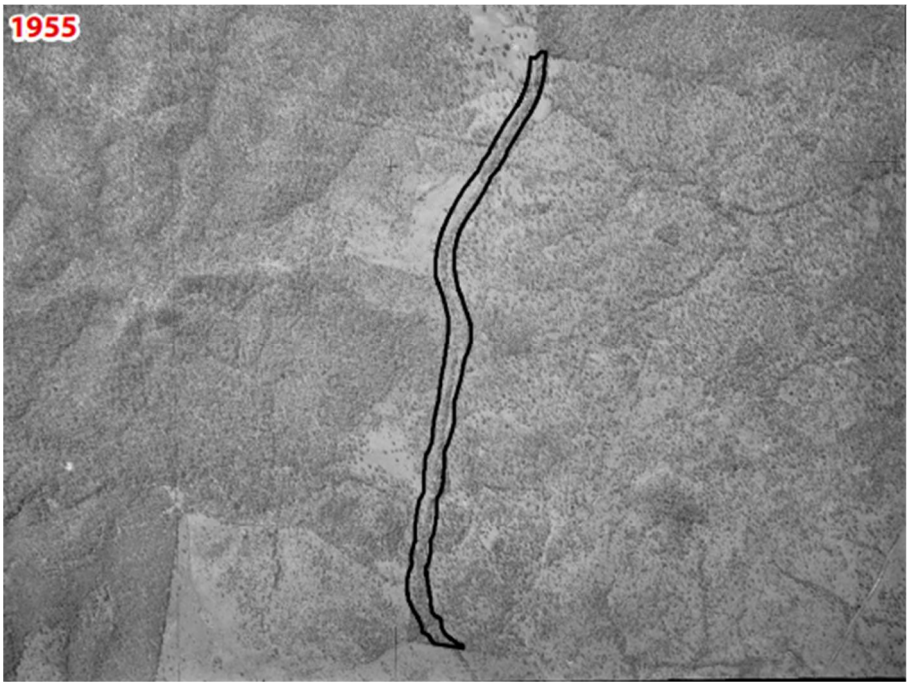
	Earliest historical aerial mapping from 1955 shows the site having been subject to clearing and modification for use of road/track, with surrounding land appearing to be utilised for rural and farming production. Board scale clearing has occurred to the south, west and north of the site.
	By 1965 historical aerial mapping shows additional built form and infrastructure having been constructed surrounding the site. Vegetation appears to have been cleared further on land adjoining the existing track, with a secondary track evident further to the east.



Earliest historical aerial mapping from 1955 shows the site having been subject to clearing and modification for use of road/track, with surrounding land appearing to be utilised for rural and farming production. Board scale clearing has occurred to the south, west and north of the site.

Over the 13 years from 1965 to 1978 the site has been further cleared to represent a well-formed unsealed road. Landscape scale clearing is evident in the locality for roads and tracks identifying the locality as a transit corridor for rural land use.

Broadscale clearing is evident in the locality for rural residential and agricultural land use, with the introduction of additional built form and tracks.



Earliest historical aerial mapping from 1955 shows the site having been subject to clearing and modification for use of road/track, with surrounding land appearing to be utilised for rural and farming production. Board scale clearing has occurred to the south, west and north of the site.

Analysis of aerial photography from 1999 identifies further clearing along the western extents of the site, with vegetation within waterway corridors generally retained. While in the eastern extents of the site vegetation appears as regrowth, having regrown and thickened within the twenty-year period from 1978. Regionally the locality has undergone further intensification for rural residential and industrial land uses with the land to the east showing larger cleared rural residential allotments.

3.1.3. Topography

The Site topography as shown on **Figure A5** is gently undulating where the road crosses over waterway crossings, moving between 70 m rising to around 90 m centrally and then lowering back to around 70 m in the south. The existing road and track remains generally flat with multiple waterways crossing. The State

mapped surface geology for the site includes *Bundamba Group (including Marburg Subgroup and Woogaroo Subgroup), Landsborough Sandstone (RJb)*[1].

3.1.4. Waterways and Waterbodies

Five mapped waterways traverse the road reserve, two in the north associated with Abrade Creek, a second in the south associated with Flagstone Creek and two tributaries of Flagstone Creek (**Figures A4 and A5)**.

The mapped waterways join to Logan River approximately 6 km to the east. The waterways are mapped under State mapping as Waterways for Waterway Barrier Works (WWBW), and with the two tributaries in the north rated as low-grade tributaries for WWBW, with two low grade and one high grade mapped waterways crossing in the south of the site. To the north, newer residential subdivisions have resulted in the land subject to leveling and grading.

3.1.4 Regulated and Pre-Clearing Vegetation

The extent and status of the current areas of mapped Regulated Vegetation are illustrated in **Figure A4.**

A summary of the Regional Ecosystems (RE's) and pre-clear ecosystems mapped over the site is provided in **Table A5**. The full description for these communities can be found in the Regional Ecosystem Description Database (REDD) prepared by the Queensland Herbarium

Table A5: Regional Ecosystem Descriptions

RE Type	VMA Class	Description	Pre-clear RE Map	Current RE Map
12.3.7	Category B	Narrow fringing woodland of Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca viminalis. Other species associated with this RE include Melaleuca bracteata, M. trichostachya, M. linariifolia. North of Brisbane Waterhousea floribunda commonly occurs and may at times dominate this RE. Melaleuca fluviatilis occurs in this RE in the north of the bioregion. Lomandra hystrix often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region. Riverine. (BVG1M: 16a).	Yes	Yes
12.3.11	Category B		Yes	Yes

[1] Queensland Globe (information.qld.gov.au)

RE Type	VMA Class	Description	Pre-clear RE Map	Current RE Map
12.9-10.2	Category B	Corymbia citriodora subsp. variegata open forest or woodland usually with Eucalyptus crebra. Other species such as Eucalyptus tereticornis, E. moluccana, E. acmenoides and E. siderophloia may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of Lophostemon confertus (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 10b).	Yes	Yes
12.9-10.7	Category B Category C	Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. Corymbia trachyphloia and/or C. citriodora subsp. variegata may dominate on areas of Pleistocene alluvia. Eucalyptus seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. Contains Palustrine. (BVG1M: 16c).	Yes	Yes
12.9-10.7a	N/A	Eucalyptus siderophloia, Corymbia intermedia +/- E. tereticornis and Lophostemon confertus open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. Not a Wetland. (BVG1M: 12a).	Yes	No
12.9-10.12	Category C	Mixed woodland to open forest usually containing Corymbia intermedia, Angophora leiocarpa and at least a presence of Eucalyptus seeana. Other commonly associated species include E. siderophloia, E. tereticornis, E. racemosa subsp. Racemosa and C. citriodora subsp. Variegata. E. seeana and Lophostemon suaveolens are often present as sub-canopy or understorey trees. Occasional Melaleuca quinquenervia on lower slopes. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 9g).	Yes	Yes

RE Type	VMA Class	Description	Pre-clear RE Map	Current RE Map
12.9-10.19	Category C	Eucalyptus fibrosa subsp. fibrosa woodland +/- Corymbia citriodora subsp. variegata, E. acmenoides or E. portuensis, Angophora leiocarpa, E. major. Understorey often sparse. Localised occurrences of Eucalyptus sideroxylon. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 12a).	Yes	Yes
12.9-10.19a	N/A	Corymbia henryi and/or Eucalyptus fibrosa subsp. fibrosa open forest. Other commonly associated species include, Corymbia citriodora subsp. variegata, E. carnea, E. siderophloia, E. crebra and E. major. Occurs in coastal areas on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 10b).	Yes	No

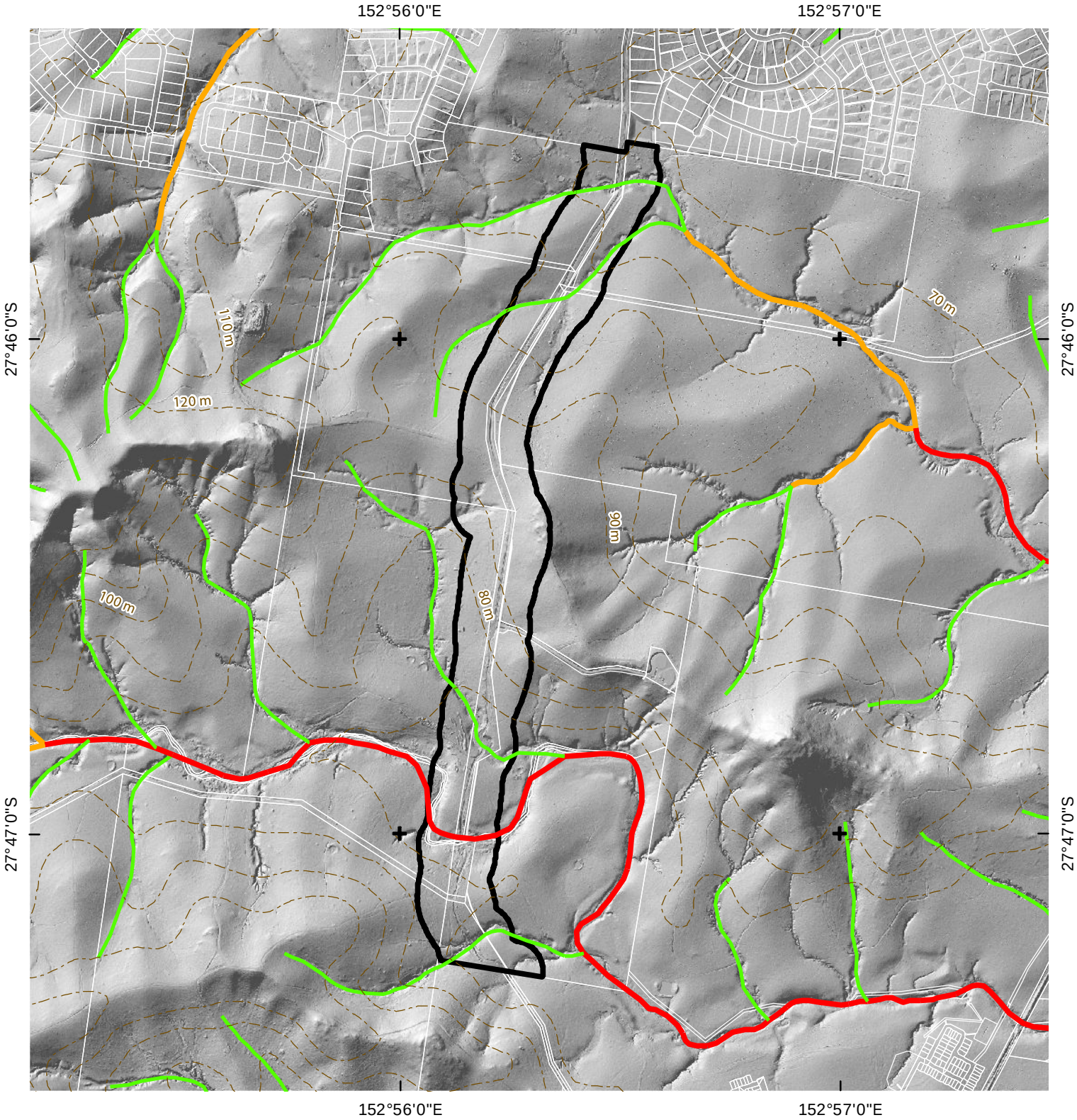
3.1.5. Vegetation Communities

Extensive field surveys have been completed to date on the site, with vegetation communities mapped in **Plan A4 – Assessment Units.**

Field surveys identified four (4) vegetation derived assessment units within the referral area and the existing cleared road and track (refer **Plan A4**) including;

1. Non-remnant cleared areas with scattered regrowth – Assessment Unit 1
2. Highly disturbed mapped remnant (RE12.9-10.2) vegetation with scattered mature eucalypt species – Assessment Unit 2
3. Waterway with associated remnant (RE12.3.11/12.3.7) Melaleuca and Lophostemon dominated vegetation – Assessment Unit 3
4. Eucalypt dominated remnant (RE12.9-10.7a) vegetation – Assessment Unit 4
5. Existing cleared track – Assessment Unit 5

Further details on vegetation communities present on the site can be found in **Section 3.4.13** of the report.



LEGEND

- Qld DCDB
- Referral Area
- 10m Contours
- Waterways (QLD)
  - *Risk of Impact*
  - 1 - Low
  - 2 - Moderate
  - 3 - High
  - 4 - Major
  - 5 - Major (Tidal)

Figure A5

Topography and
Water Resources

CLIENT

PEET Flagstone
City Pty Ltd

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:20,000

0 100 200 300 400 500 m

N

Saunders Havill
BOWEN HILLS | SPRINGFIELD
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mail@saundershavill.com

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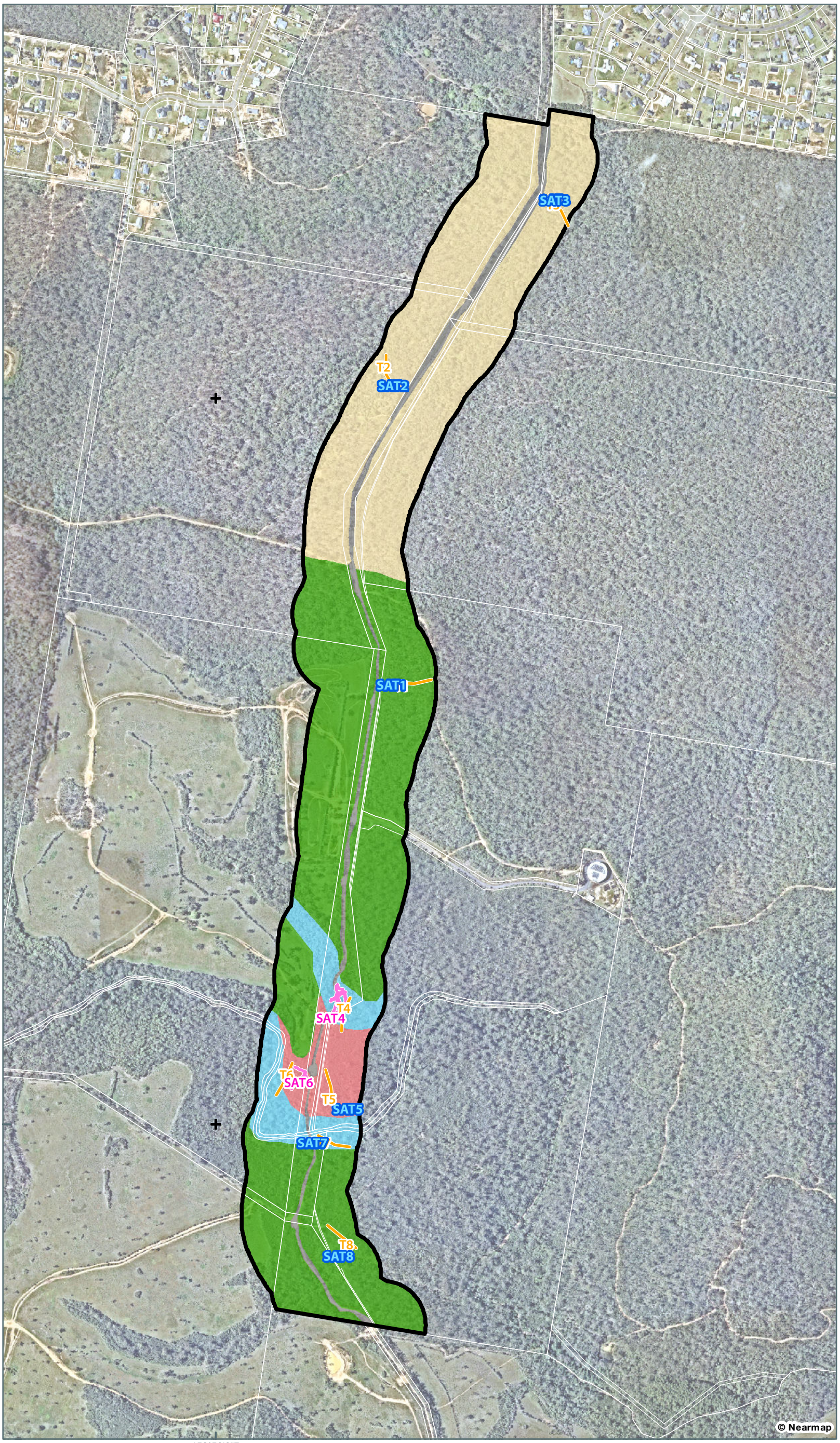
LAYER SOURCE *© State of Queensland 2025, Service Layer Credits:*

FILE REFERENCE
8418 E Figure 5 NBR Topography A

DATE 10/07/2025

A4. ASSESSMENT UNITS



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

Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
© State of Queensland (Department of Resources) 2025.
Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/
* This note is an integral part of this plan/data. Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Qld DCDB
- Referral Area
- SAT Survey Locations
- Meander – no scats recorded
- Habitat quality transects

Assessment Units

- *Assessment Unit 1:* Pre-clear RE 12.9-10.19a [31.5 ha]
- *Assessment Unit 2:* Pre-clear RE 12.9-10.2/12.9-10.7 [44.1 ha]
- *Assessment Unit 3:* Pre-clear RE 12.3.11/12.3.7 [6.2 ha]
- *Assessment Unit 4:* Pre-clear RE 12.9-10.7a [4.2 ha]
- *Assessment Unit 5:* Existing cleared track [4.4 ha]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	16/07/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

16/07/2025

8418 E A4 NBR Assessment Units A

3.2. Description of potential MNES

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

3.2.1. Likelihood of Occurrence

A likelihood of occurrence assessment of MNES that may occur on, or adjacent to the site was conducted for the Controlled Action Referral. The assessment was informed by site values including vegetation communities, habitat, habitat quality and desktop analysis of the species.

The DCCEEW Information Request of 22 November 2023 stated that the Department considered that the matters that may or were likely to be significantly impacted by the proposed action include, but are not limited to:

- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and Southeast Queensland bioregions – Endangered
- Koala (*Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT)) – Endangered
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable
- Greater Glider (*Petauroides volans*) – Endangered
- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*) – Vulnerable
- Swift Parrot (*Lathamus discolor*) – Critically endangered
- Regent Honeyeater (*Anthochaera phrygia*)- Critically Endangered
- Yellow-bellied Glider (*Petaurus australis australis*) – Vulnerable
- Spotted-tailed Quoll (*Dasyurus maculatus maculatus*) – Endangered

The following table (**Table A6**) provides a summary assessment of these species in the context of the surrounding landscape and the Site. This assessment has been developed from material drawn from *Part B – Referral* and further analysis. Greater detail for these species is presented in **Section 3.3.**

Table A6: Field Assessment Confirmed Likelihood of Occurrence - Threatened Fauna

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
Anthochaera phrygia (Regent Honeyeater)	Critically Endangered	Endangered	**Low** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. Potential foraging habitat may be present within Eucalypt dominated vegetation onsite.	**Low (potential foraging habitat)** Regent Honeyeaters occupy dry Box-Ironbark eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister more fertile sites, with an abundance of large trees and mistletoes. Field surveys determined the site is not dominated by box and ironbark eucalypts, although *Eucalyptus siderophloia* (Grey Ironbark) were recorded during field surveys. Mistletoe species were observed within the referral area but predominately associated with *Alphitonia excelsa* (Soap Tree) and were sparse. Three records of the Regent Honeyeater are present on ALA from 2021 within bushland approximately 5 km south-west of the referral area. Vegetation onsite represents potential foraging habitat for this species.
Calyptorhynchus lathami lathami (South-eastern Glossy Black-cockatoo)	Vulnerable	Vulnerable	**Moderate** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and	**Moderate – Low** Field surveys located scattered isolated black sheoak (*Allocasuarina littoralis*) in areas of the remnant vegetation adjacent to and within

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. Potential foraging habitat may be present within Eucalypt dominated vegetation onsite. Potential feeding trees including *Allocasuarina* and *Casuarina* species present on site. ALA lists one (1) record of the Glossy Black Cockatoo within a 5km radius of the referral area (refer **Plan A14**). This record is located north of site and dates back to 2013. Biomaps does not show any records within 5km.	the New Beith Road reserve. In addition, vegetation within the Category X area at the northern extent of the road reserve contains an understorey of *A. littoralis* on the western side. Weed disturbance is high throughout the *A. littoralis* stands, with *Lantana camara* (Lantana), *Ageratum houstonianum* (Blue Billy Goat), and *Paspalum dilatatum* (Paspalum) dominating the ground and shrub layers. Searches of these habitat areas did not identify any feeding "orts" within *Allocasuarina littoralis* stands characteristic of Glossy Black-cockatoo. Substantial clearing has occurred within the northern and central extents of the road reserve, and on adjacent land to the west. In this area, vehicle disturbance is common among other illegal uses. The presence of potential habitat of only poor quality and high levels of vehicle disturbance on the site suggests a 'moderate to low' likelihood of occurrence on-site.
Dasyurus maculatus maculatus (Spotted-tailed Quoll)	Endangered	Endangered	**Low** The referral area within the New Beith Road reserve extent and surrounding	**Unlikely** The road reserve has been subjected to high levels of disturbance with

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves and large areas of relatively intact vegetation to forage. As limited desirable habitat is present onsite and modified areas of vegetation throughout the impact area and the limited species records within the broader landscape, a desktop assessment of the likelihood of occurrence has been assigned 'low.'	areas adjacent to the site historically cleared and continuously modified through the years. No suitable denning habitat was observed during field surveys. Due to the lack of suitable habitat, it is unlikely that this species would occur.
Hirundapus caudacutus (White-throated Needletail)	Vulnerable	Vulnerable	**Low** The referral area within the New Beith Road reserve extent and surrounding	**Low** While some areas of remnant vegetation remain, large areas of the

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. The White-throated Needletail most often occurs above open forest, rainforests and heathland however they are less commonly recorded above woodland, which characterises much of the regional ecosystems present on site. A search of the Atlas of Living Australia returned 42 records for the species using a 5 km search radius from a central point in the site, predominantly located to the north of the site. WildNet Online records 0 sightings within a 5 km radius of the site. Therefore there is potential the species may occur as a flyover.	road reserve and adjacent rural and residential areas represent heavily modified open space with scattered larger trees. This environment is the less preferred of the White-throated Needletail and therefore it is unlikely the species would find the site as a suitable roosting area. The species was not observed onsite during survey works. The lack of recent local records suggests a low likelihood this species would occur onsite.
Lathamus discolor (Swift Parrot)	Critically Endangered	Endangered	**Low** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing	**Low (potential foraging habitat)** The Swift Parrot breeds in Tasmania during spring to early summer and migrates to the mainland during

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. Potential foraging habitat may be present within Eucalypt dominated vegetation onsite. There are no recent records of the species within 5km or 10km of the subject site within the last 20years on the ALA Database.	autumn and winter to forage. Large portions of the referral area are mapped as Category X (non-remnant) under the Queensland *Vegetation Management Act 1999* where high levels of disturbance occur throughout the road reserve. Field surveys determined potential foraging habitat in eucalypt dominated areas through the Category B vegetation within the referral area although higher quality habitat is present within the broader landscape, particularly large intact bushland further to the west. Occurrence is considered low and would likely be limited to opportunistic foraging and the vegetation would be unlikely to be critical foraging habitat.
Petauroides volans (Greater Glider)	Endangered	Vulnerable	**Moderate** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE	**Moderate – Low** Field surveys confirmed the presence of hollow bearing trees within the road reserve and scattered within adjacent remnant bushland. No individuals were recorded during field surveys. Due to the high disturbance with vehicle use and other illegal uses, and the modification of surrounding habitat

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. The areas of Category X vegetation are highly disturbed and represent historical clearing with only scattered mature trees remaining. One (1) record of Greater Glider is found within 5 km of the site dating back to 1994. A10 km search radius from the site returned twelve (12) recent records of Greater Glider. It is noted significant barriers exist between the site and this record in the form of residential developments, main roads and cleared agricultural land.	it is considered a moderate likelihood this species would occur onsite. Substantial clearing has occurred within the northern and central extents of the road reserve, and on adjacent land to the west. In this area, vehicle disturbance is common among other illegal uses. However, throughout the road reserve, large mature hollow-bearing trees remain which provide suitable habitat for the Greater Glider. Connectivity to vegetation is limited with residential areas to the north and cleared modified areas in the south and southwest. Vegetation associated with Flagstone Creek remains a form of connectivity from vegetation in the east to larger intact bushland in the west (**Plan A11**). The presence of potential habitat but high disturbance suggests a moderate-low likelihood of occurrence on-site.
Petaurus australis australis (Yellow-bellied Glider)	Vulnerable	Vulnerable	**Moderate** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the	**Low** Eucalypt forest was identified onsite, although the vegetation is not within a high rainfall area and the soils are considered nutrient poor. Large portions of adjacent vegetation have

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			Vegetation Management Act 1999 (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. The areas of Category X vegetation are highly disturbed and represent historical clearing with only scattered mature trees remaining. A search of the Atlas of Living Australia returned 4 records located in the south east direction from the impact site with the most recent occurrence in 2021. Within 10km of the impact site and buffer area found 18 records and a further 8 records were observed when expanding to 20km. In the broader landscape, records are focused north of the impact area. As the species is known to forage in a variety of habitats, including eucalypt dominant woodlands as are present on-site. Furthermore, given the species can have reasonably large home ranges it is possible the impact area may be utilised for foraging. However given the presence of species records in the broader landscape, a	been modified or cleared for agricultural purposes. Hollows were identified during field surveys within scattered mature eucalypt species along the New Beith Road reserve. No individuals were observed during field surveys and no feeding marks typical of the species were recorded, noting the species is readily recorded. Although the site comprises high levels of disturbance, due to presence of suitable habitat and recent local records, there is a low likelihood this species would occur onsite.

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			desktop assessment of the likelihood of occurrence has been assigned 'moderate.'	
Phascolarctos cinereus (Koala)	Endangered	Endangered	**Moderate** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. Koala food trees are indicator species for these regional ecosystems and are present on the referral site. As the species is known to occur within the broader landscape as well as the presence of potential habitat within the referral area, the likelihood of occurrence has been assigned 'moderate'.	**Known** Field surveys confirmed Koala habitat is present within the referral area in the form of *Corymbia citriodora* and *Angophora leiocarpa* dominated woodland fringing the southern extent of the road reserve. Field surveys of the Eucalypt dominated areas found the northern and eastern patches to contain retained mature canopy trees with a fairly intact understorey. Vegetation in the south and southwest has been cleared, with very few mature canopy trees remaining and a modified ground and understorey layer of maintained grass. This area experiences high levels of disturbance from vehicle and motorbike uses. Vegetation in the south contains scattered mature canopy trees with a dense understorey of *Acacia sp.* reflecting historic fire disturbance.

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
				Connectivity to vegetation is limited with residential areas to the north and cleared modified areas in the south and southwest. Vegetation associated with Flagstone Creek remains a form of connectivity of Koala habitat from vegetation in the east to larger intact bushland in the west (**Plan A7**). Evidence of Koala in the form of scats was recorded during field surveys, suggesting Koalas are utilising the site.
Pteropus poliocephalus (Grey-headed Flying-fox)	Vulnerable	-	**Moderate** The referral area within the New Beith Road reserve extent and surrounding vegetation are mapped as containing Category X (non-remnant) and Category B (remnant) under the *Vegetation Management Act 1999* (QLD). The site and adjoining vegetation is mapped as containing vegetation of least concern regional ecosystem 12.9-10.2, of concern RE 12.9-10.7 and composite of concern RE 12.3.11/12.3.7 and 12.9-10.2/12.9-10.7. The canopy species within these regional ecosystems indicate potential foraging habitat may be present within the referral area.	**Low (potential foraging habitat)** Field surveys confirmed the presence of potential foraging habitat for the GHFF on-site in the form of fragmented eucalypt woodland within the north and south of the site, which contains *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia citriodora* (Spotted Gum). These trees are mature and may present foraging habitat when flowering. Some flowering eucalypts were present during spotlighting activities although the Grey-headed Flying-fox was not recorded.

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
			A review of the National Flying-fox viewer indicates that the nearest active roost site is approximately 4.1 km south-east of the site, being Ulladulla, Homestead Drive Equestrian (site 464), with the next closest being 12.0 km north of the site, at Cedar Vale, Banksia Court (site 310). There are three (3) records the species within a 5 km radius of the site recorded on Atlas of Living Australia. These date back to 1992 with two records in 1994. As the species is known to forage in a variety of habitats, including open woodland areas present on-site, a desktop assessment of the likelihood of occurrence has been assigned 'moderate.'	Due to the lack of recorded sightings in the area and availability of higher quality habitat for this highly mobile species adjacent the site, there is low but potential likelihood that the species may opportunistically forage on-site.

The complete likelihood of occurrence is provided in **Appendix A6.**

3.3.Technical Details of Listed MNES

Item 3.3 of the PD Request asks ***'For listed threatened species and ecological communities that have the potential, or are likely, to be presented at and in the vicinity of the project site, please provide a likelihood of occurrence assessment including the following:***

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

Likelihood of occurrence and habitat assessments must be informed by up-to-date desktop and field surveys and informed by relevant departmental documents (e.g., approved Conservation Advice, Recovery Plans, draft referral guidelines and Listing Advice, and SPRAT Database) and/or species experts.

3.3.1. Koala (Phascolarctos cinereus)

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

General Information

Distribution

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.

Abundance

In South East Queensland (SEQ), a 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 the Logan LGA from 1996 to 2015 is 0.12 koalas/ha which shows the koala density in the Logan LGA from 2008 until 2015 is 0.04 koalas/ha, while from 1996 to 2008, the koala density was 0.26 koalas/ha.

Recent data indicate that Koalas in SEQ (though also the Brigalow Belt and Mulga Lands bioregions) are subject to substantial declines (Dique *et al.,* 2004; DERM 2009). The so-called 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 South East Queensland, 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.

Habitat and Ecology

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 South East Queensland include the following (after: Pahl 1993; QEPA 2002 & 2006a; & 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*.

Home ranges are also 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 South East Queensland, Koala Coast home ranges were found to vary between 2-20 ha (Thomson 2006), whilst in rural south-east Queensland, 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 2006a 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 2006a and references cited therein). Koala populations in SEQ, the Brigalow Belt and Mulga Lands bioregions are subject to substantial declines (Dique *et al.,* 2004; DERM 2009).

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) on site and, where feasible, in the broader landscape.

The site contains suitable habitat for the koala in the form of eucalypt trees. Thirteen species of preferred Koala food and habitat species were recorded on-site, including Forest Red Gum (*Eucalyptus tereticornis*), Narrow-leaved Ironbark (*E. crebra*), Grey Ironbark (*E. siderophloia*), Narrow-leaved Red Gum (*E. seeana*), White Mahogany (*E. acmenoide*s), Swamp Stringybark (*E. conglomerata*) Spotted Gum (*Corymbia citriodora*), Pink Bloodwood *(C. intermedia*), Brown Bloodwood (*C. trachyphloia*), Moreton Bay Ash (*C. tessellaris*), Broad-leaved Paperbark (*Melaleuca quinquenervia*), Swamp Box (*Lophostemon suaveolens*) and *Angophora leiocarpa* (Smooth-barked Apple).

Six (6) SAT surveys and two (2) Scat Meanders were conducted across the site in 2024 and three (3) SAT surveys were conducted previously in 2022. The results varied from 0/30 scats recorded, to 3/30. Applying the East Coast (med-high) categories, low Koala usage is present across the site based on these observations. Three (3) motion sensor cameras were also deployed across the wider allotment area in 2024 field surveys by SHG. The most common species recorded by the cameras were Red-necked Wallaby (*Macropus rufogriseus*), Australian Brush-turkey (*Alectura lathami*), followed by the Common Brushtail Possum (*Trichosurus vulpecula*) and Black Rat (*Rattus rattus*). Dogs have also previously been recorded on the site during 2022 surveys, indicating the threats that exist on-site to native fauna.

The site is located within the Greater Flagstone PDA. The surrounding locality has undergone significant development including residential development to the north and south-east, the interstate rail line to the east and Flagstone Town Centre further south (**Figure A1**). As such the site is subject to significant fragmentation. Presently the site is connected to a larger block of vegetation which extends to the east, south and west (**Figure A2**). However, areas to the south within the Flagstone PDA have been earmarked for future development which will isolate the site from vegetation in the south.

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

The site contains suitable habitat for the koala in the form of eucalypt trees. Numerous *Eucalyptus* and *Corymbia* species of preferred Koala food and habitat were recorded on-site, including Forest Red Gum (*E. tereticornis*), Narrow-leaved Ironbark (*E. crebra*), Grey Ironbark *(E. siderophloia*), Narrow-leaved Red Gum (*E. seeana*), Spotted Gum (*C. citriodora*), Pink Bloodwood (*C. intermedia*), Brown Bloodwood (*C. trachyphloia*), Moreton Bay Ash (*C. tessellaris*) and Broad-leaved Paperbark (*M. quinquenervia*).

The site contains limited quality vegetation for the Koala, with a combination of remnant and non-remnant vegetation mapped on-site. The site will maintain minimal connectivity to remnant vegetation, with

considerable non-remnant vegetation in the west along site boundaries, and future development planned in the south and east, which will limit Koala movement. The confirmed presence of dogs on-site also provides a deterrent to Koala.

The vegetation on the referral site is not required for the long-term maintenance of the species as there is no species essential to the survival of Koala within the referral site that are not found commonly throughout the broader landscape. Furthermore, more preferable and contiguous habitat is located within extensive bushland to the west of the site.

The referral site shows indirect evidence of current Koala usage in the form of scats, however no direct observations were made. It is likely this area will have limited accessibility for Koala to use for foraging, breeding or dispersing in future as a result of the development within the Greater Flagstone Development Area and existing fragmenting factors on all sides (**Plan A3**).

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

Detailed analysis of available DES and Koala Hospital data indicates that records of Koala have been recorded within a 5 km radius of the proposed action area. **Plan A5 – Koala Records** shows fifty (50) records of the species within 5 km of the site and 2,217 records of Koala within 20 km of the site. This reflects Koala sightings shown by Atas of Living Australia (ALA) and Wildlife Online includes most recent records in 2023 within 5 km of the site. The records are located predominately to the north, east of the subject site and within the Flinders-Goolman and White Rock Spring Mountain Conservation Estates .

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

The New Bieth Road reserve impact area and buffer are mapped as a combination of Category X (non-remnant) and Category B (remnant) under the Vegetation Management Act 1999 (QLD) (**Figure A4**). State Koala habitat area mapping occurs onsite and within the broader landscape, however, it does not fall within a Koala Priority Area under the Queensland Government (refer **Figure A6**).

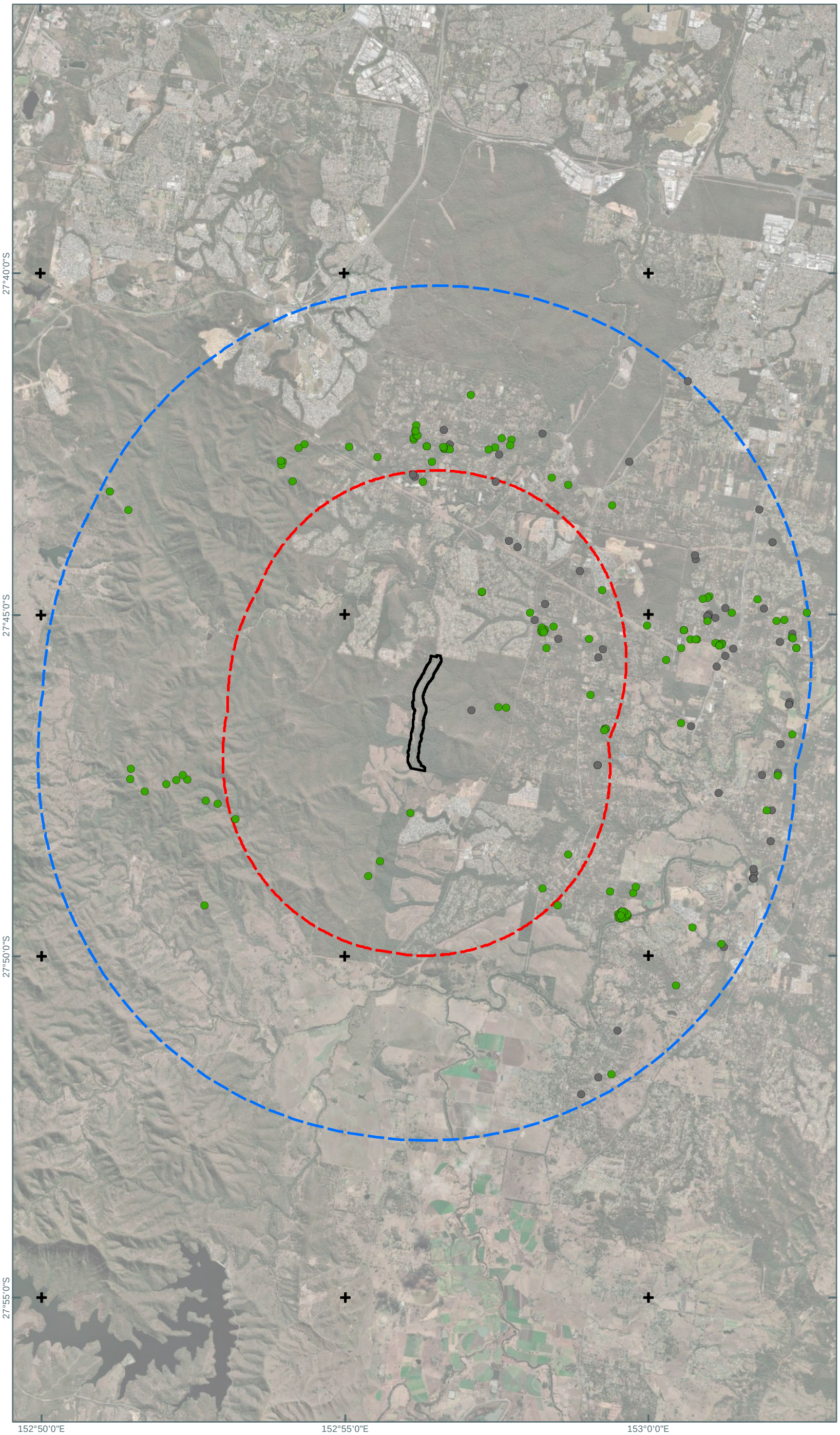
Koala habitat is present throughout the impact site in varying value and connectivity. Connectivity to vegetation is limited with residential areas to the north and cleared modified areas in the south and southwest. Vegetation associated with Flagstone Creek remains a form of connectivity of Koala habitat from vegetation in the east to larger intact bushland in the west.

Field surveys of the eucalypt dominated areas found the northern and eastern patches to contain retained mature canopy trees with a somewhat intact understorey. Vegetation in the south and southwest has been cleared, with very few mature canopy trees remaining and a modified ground and understorey layer of maintained grass. This area experiences high levels of disturbance from vehicle and motorbike uses. Vegetation in the south contains only very scattered mature canopy trees with a dense understorey of regrowth *Acacia* sp. reflecting historic fire disturbance. Field survey efforts confirmed vegetation within the impact and buffer areas are characterised by a canopy dominated *by C. citriodora* (Spotted Gum), *E. tereticornis* (Forest Red Gum) and *Angophora leiocarpa* (Smooth-barked Apple) typical of Koala habitat. Extensive field

surveys did not reveal direct evidence of Koala activity. Indirect evidence of Koala was observed through SAT survey techniques and SAT meander which revealed low usage.

Given the existing Koala records in the context of the site, the existence of habitat and partial connectivity across vegetation patches, there is potential that the species could utilise the site for opportunistic foraging.

A5. KOALA OCCURRENCE RECORDS



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Layer Sources

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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer

Koala Records (ALA/WildNet 2024)

- Koala sightings within 10km of referral area recorded within past 20 years
- Koala incidental records within 10km of referral area recorded within past 20 years

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

1:105,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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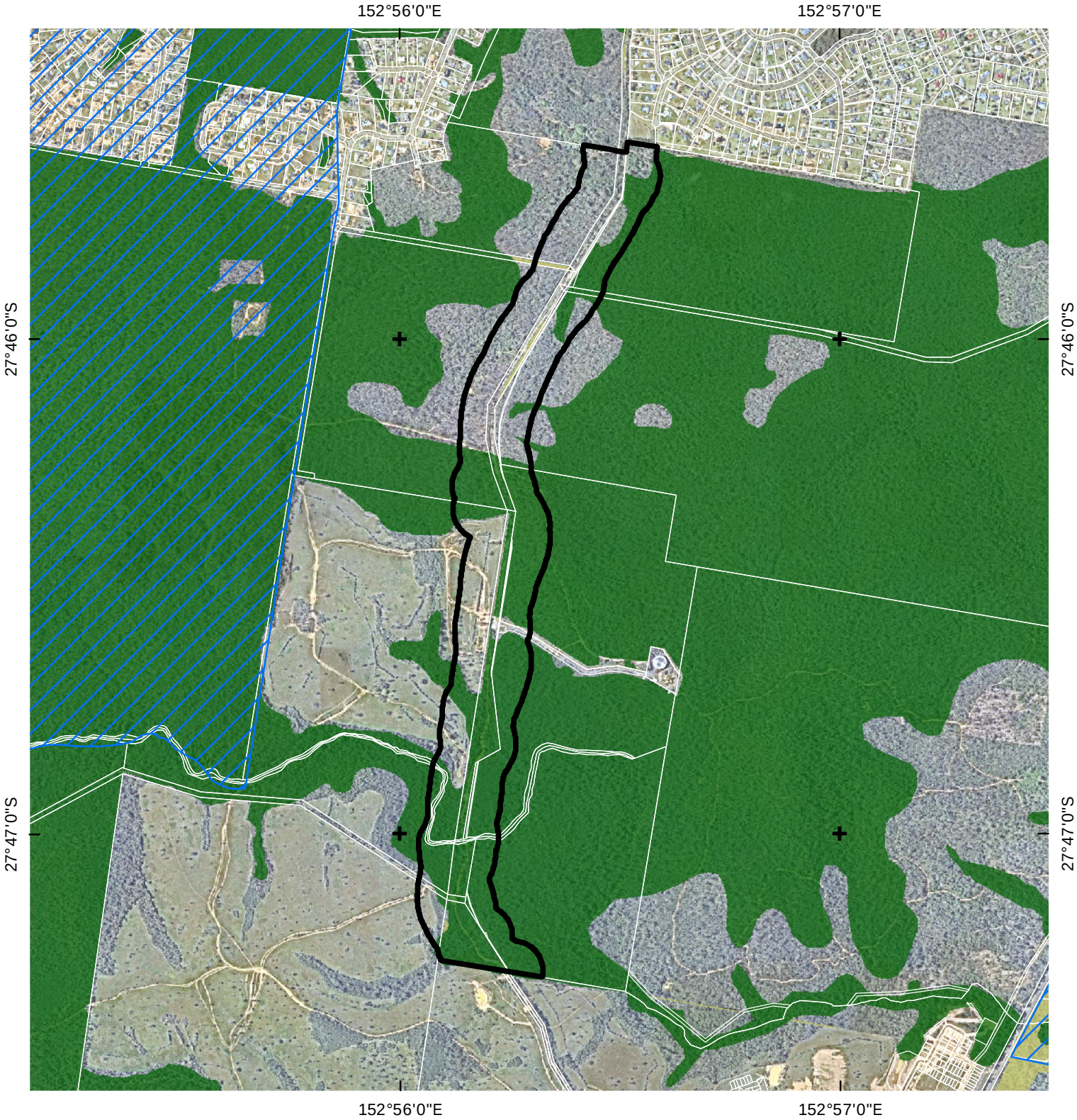
8418 E A5 NBR Koala Records A



LEGEND

- Qld DCDB
- Referral Area
- Koala Priority Areas
- Locally Refined Koala Habitat Areas
- Core Remnant Koala Habitat Areas
- Core Regrowth Koala Habitat Areas

Figure A6

Koala Priority Areas and
Koala Habitat Areas

CLIENT

PEET Flagstone
City Pty Ltd

PROJECT
New Beith Road

COORDINATE SYSTEM
GDA 2020 MGA Z56

SCALE (A4)
1:20,000

0 100 200 300 400 500 m

N

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FILE REFERENCE
8418 E Figure 6 NBR Koala A

DATE 10/07/2025

3.3.2. Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

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

The Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions (**SEFFW**) TEC is known to occur in the New South Wales North Coast (**NNC**) and South Eastern Queensland (**SEQ**) bioregions and on Curtis Island in the Brigalow Belt North (**BBN**) bioregion. This encompasses an area from just north of Newcastle, New South Wales (around Raymond Terrace) in the south, to just north of Gladstone in Queensland.

It occurs on alluvial landforms including river floodplains, riparian zones, the floors of tributary gullies, floodplain pockets, alluvial flats, fans, terraces, and localised colluvial fans; as well as on localised depressions amongst low rises and on associated sites where water can pond. It generally occurs below 50 m above sea-level (ASL), although it can occur up to 250 m ASL. The SEFFW TEC varies from a tall open forest to woodland, dominated by eucalypts and/or other myrtaceous trees specifically from the Angophora, Corymbia, Lophostemon and Syncarpia genera which occurs on alluvial landforms. A mid-layer or sub-canopy of small trees may be present for example, Melaleuca, Leptospermum and related genera may form dense thickets beneath the main canopy, or in gaps between canopy trees. The ecological community generally has a more diverse and abundant groundcover than ecological communities on locally adjoining slopes. The ecological community typically forms 'mosaics' with other floodplain forest communities, lowland woodlands and treeless wetlands. The following Regional Ecosystems form part of or align with the TEC: 12.3.2, 12.3.2a, 12.3.3, 12.3.3a, 12.3.3b, 12.3.3d, 12.3.4a, 12.3.7, 12.3.7c, 12.3.7d 12.3.10, 12.3.11, 12.3.11a, 12.3.11b, 12.3.12, 12.3.14a, 12.3.15, 12.3.19.

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

Desktop analysis and field surveys confirm the remnant Of Concern RE12.3.11 occurs onsite (**Figure A4**). This RE was found to be associated with creek crossing areas within the New Beith Road reserve. The current road passes directly through the vegetation described as the RE 12.3.11 / 12.3.7. A very small portion of the road reserve intersects vegetation mapped as RE12.3.11 / 12.3.7 in association with Flagstone Creek and a northern tributary of Flagstone Creek. In this area vegetation is consistent with the mapped RE 12.3.11/ 12.3.7 where canopy vegetation is dominated by *Eucalyptus tereticornis* (Forest Red Gum) and scattered *Angophora leiocarpa* (Smooth-barked Apple), with an understorey of *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box). Substantial weed infestations dominate the ground layer including *Paspalum mandiocanum* (Broad-leaved Paspalum), *Chloris gayana* (Rhodes grass) and *Lantana camara* (Lantana) dominate the ground and shrub layer. Although the area is small and contains substantial weed encroachment, it is considered to represent some characteristics of this TEC.

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

In accordance with the DCCEEW Approved Conservation Advice (2022), to be protected as a Matter of National Environmental Significance (MNES) areas of the ecological community must meet both:

- the key diagnostic characteristics

- at least the minimum condition thresholds (refer **Section 4.3**)

The SEFFW TEC was ground-truthed within the broader waterway corridors, intersecting part of the referral area. Field survey confirmed two areas mapped as RE12.3.11 / 12.3.7 within the referral area meet the key diagnostic characteristics of the Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions TEC outlined in DCCEEW Approved Conservation Advice (2022) (refer **Plan A6**). In addition, the patch sizes are considered to be large contiguous (> 2ha) and field surveys confirm the two areas of potential TEC fall into Class B3 and C2 *Condition Class* within the '*small contiguous patch – Patch size ≥0.5, within a larger area of native vegetation ≥5'* on the basis that vegetation is "Good Quality" and "Moderate Quality" respectively (refer **Section 4.3.1**):

- Ground cover richness1 ≥ 6 native species per sample plot AND
- ≥ 10 large native trees per ha AND
- ≥ 50% of its total perennial understorey vegetation cover comprises native species

The proposed works will fragment existing TEC patches to the east and west as the road and batters will be expanded to 74.5 m and 124.6 m which exceeds the allowances specified in the conservation advice (30 m) (**Plan A6**). However, vegetated patch sizes subsequently fragmented exceed specific area limits to be considered significantly impacted (they remain ≥ 5ha, **Plan A26**). It is noteworthy that only areas already disturbed for the existing road reserve will be impacted under this proposal.

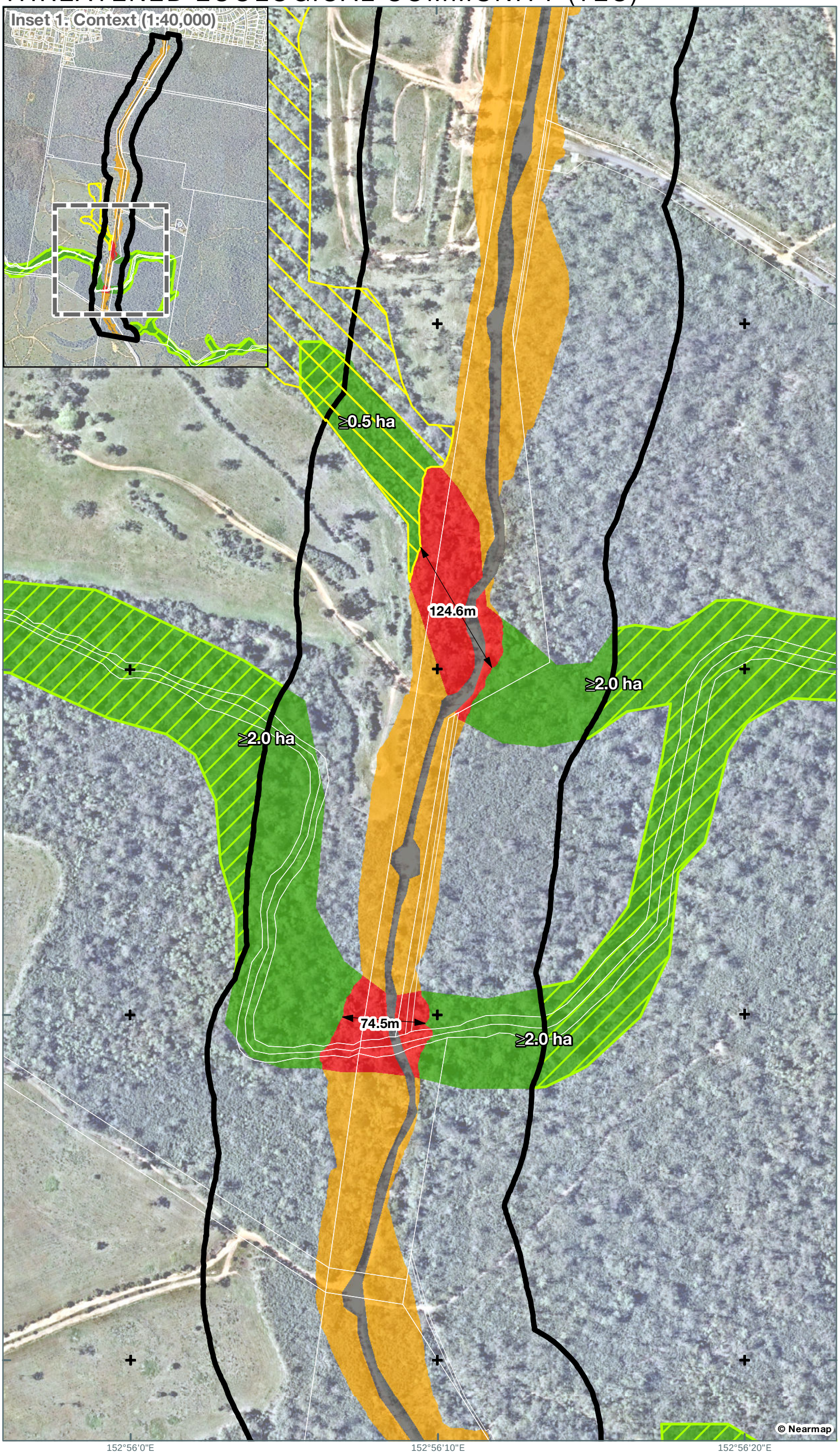
d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

Aside from the remaining vegetation associated with Flagstone Creek outside of the impact area, the known RE locations with the potential to be the SEFFW TEC occur towards the north-east of site in association with Abrade Creek and in the south in association with Sandy Creek. However, this vegetation has not been assessed as part of this action so remain unconfirmed (refer **Plan A7**).

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

The results of the desktop likelihood of occurrence assessment determined that the Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland Bioregions TEC had a moderate likelihood to occur based on the presence of indicative Regional Ecosystems on site. Field surveys confirmed the TEC occurs on site. No other TECs were likely to occur due to the absence of indicative Regional Ecosystems and species or habitat values on site typically associated with these TECs. However, only disturbed areas of the listed TEC are included within the impact area.

A6. REFERRAL AREA - POTENTIAL SUBTROPICAL EUCALYPT THREATENED ECOLOGICAL COMMUNITY (TEC)



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LEGEND

- Qld DCDB
- Referral Area
- Direct impact area excluding existing cleared track
- Existing cleared track

TEC Assessment

- Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion
- Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion directly impacted [1.5 ha]
- State mapped Regional Ecosystem indicative of TEC
- Patch of native vegetation ≥ 5.0 ha
- Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion fragmentation widths

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/07/2025	Preliminary	TF	AD

N 0 50 100 150 200 m

1:3,500 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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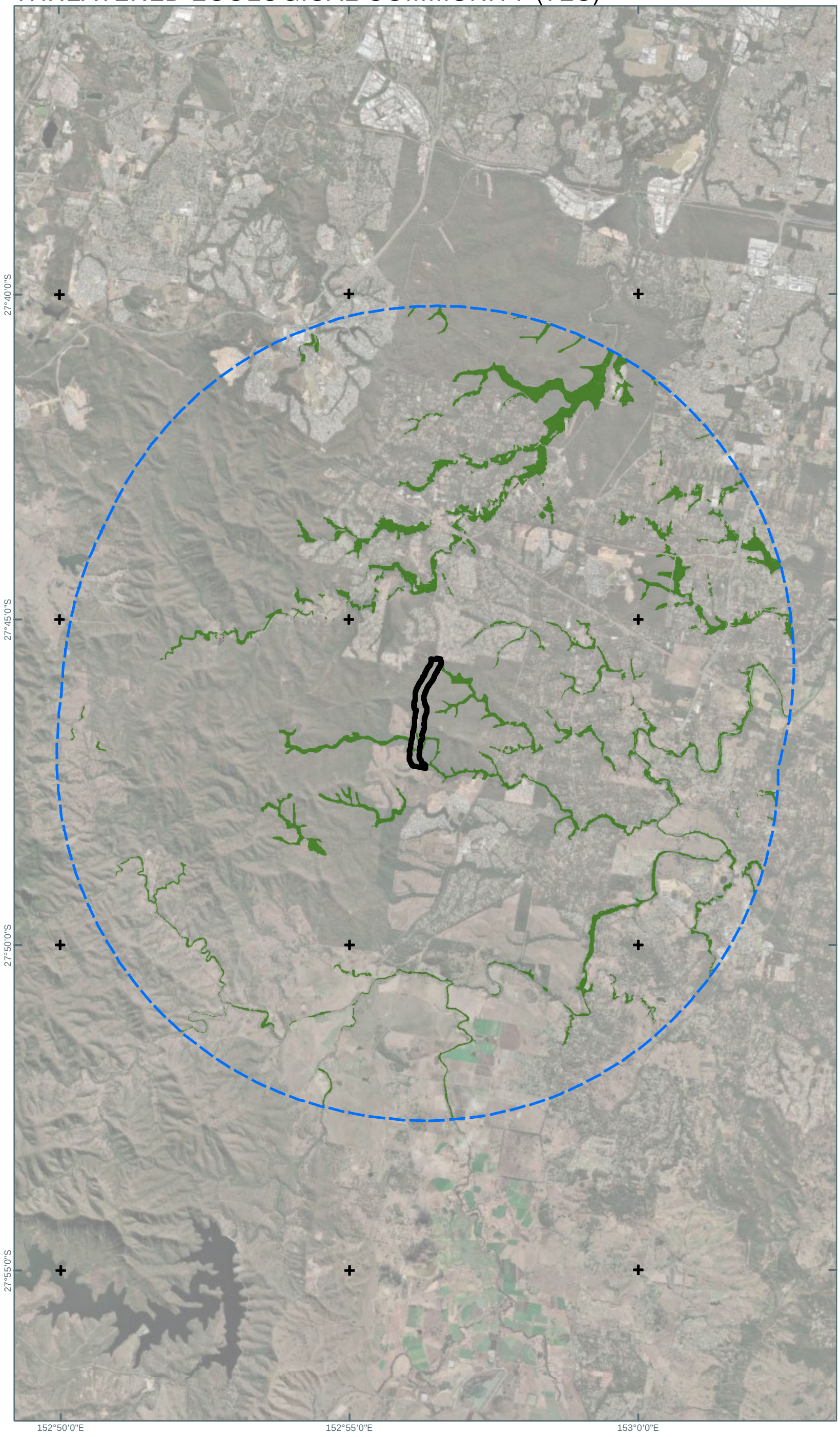
15/07/2025

8418 E A6 NBR Impact TEC A

A7. LANDSCAPE - POTENTIAL SUBTROPICAL EUCALYPT THREATENED ECOLOGICAL COMMUNITY (TEC)



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LEGEND

- Referral Area
- 10km Referral Area Buffer
- Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion within 10km of referral area [1,736 ha]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

1:110,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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8418 E A7 NBR Landscape TEC A

3.3.3. Grey-headed Flying-fox (*Pteropus poliocephalus*)

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

General Information

Distribution

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

Habitat and Ecology

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

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

SEQ has a permanent and abundant population of GHFF and available habitat is spread throughout the region, given the high prevalence of flowering and fruiting trees in eucalypt woodlands and urban environments. The species is known to forage within a variety of habitat areas due to variability in flowering periods of species throughout the year. Data derived from the Department's National Flying-fox monitoring program indicated at the time of PD submission, that the closest GHFF camps to the proposed action were not of national significance (refer **Plan A8** and **Plan A9**).

Within the broader landscape, four (4) roosts within the 40 km of the site are located within the extent from Brisbane to the central Gold Coast. Using the National Flying-fox monitoring program interactive mapping, Flying-fox camps were identified as being active (i.e., containing GHFF) during field surveys in 2021 conducted by CSIRO. Opportunistic and targeted surveys did not locate roosting sites on the subject site or within the immediate vicinity of the site. No Grey-headed Flying-fox individuals were recorded during field surveys.

Habitat Extent

The regional ecosystems located within and adjacent to the impact area and buffer areas are characterised by winter and spring flowering species known to be preferred by GHFF including *Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum).

In addition to the important winter and spring flowering species identified in the National Recovery Plan for the GHFF (DAWE 2021), vegetation communities that 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 are also considered critical habitat for the species. This includes species that flower from August to May. These vegetation communities were located onsite, excluding the north extent of the impact site which is mapped as Category X (non-remnant) vegetation.

Due to the distance of nationally significant roosts to the impact site it is considered unlikely that GHFF would utilise the area as primary foraging habitat, given the more contiguous vegetation in the west and east located between the impact site and roost location. While it is feasible for GHFF to travel up to 40 km from their current roost to forage, it is considered atypical and undertaken rarely, giving rise to the mean, median and quartile distances provided within the recovery plan. These data present that 75% of all flights within the study (Westcott et al. 2015 as per the Recovery Plan), were less than 28 km, with 25% of them being less than 6.2 km. Tidemann 1999, Eby 1991 and Boardman et al 2021 all indicate that GHFF individuals typically forage within 20 km of roost sites.

Furthermore, the impacted vegetation is relatively narrow linear strip between inconsistent vegetation patches. However, given the proportion of winter and spring flowering species which are present as within the mapped REs located on or adjacent to site it is possible for foraging activity to occur within the area.

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

The site contains eucalypt specimens, with several winter flowering eucalypt species present including *E. tereticornis, E. moluccana, E. siderophloia*, *C. citriodora*, and *C. intermedia*. However, given the site's proximity to roosting sites and the presence of potential foraging habitat on-site, there is moderate likelihood that the species may opportunistically forage on-site., although no evidence of active usage was recorded during field surveys. It is acknowledged that at the time of the referral, the Department considered Grey-headed Flying-fox habitat analogous with foraging and dispersal habitat for the Koala (**Plan A8)**. As such, vegetation on-site is considered to provide suitable foraging habitat for the Grey-headed Flying-fox. However, the difference in use of habitat between the two species is highlighted in that canopy cover is a more suitable representative of habitat availability for the Grey-headed Flying-fox, whereas Koala habitat under the Departmental guidelines is defined as including open paddock space.

Vegetation within the site, predominately the pre-existing road reserve, has been highly modified due to past extensive clearing and present road use. Furthermore, the impact area consists of a narrow linear strip which offers limited additional value compared to the broader context of the site.

It is considered that the site does provide potential habitat to the species although there are areas of more favourable habitat supporting greater densities and floristic diversity of foraging trees in addition to active roost sites to the north and west of site.

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

A review of the National Flying-fox viewer indicates that the nearest active roost site is approximately 4.1 km south-east of the site, being Undullah, Homestead Drive Equestrian (site 464) (**Plan A8**). There are three (3) records the species within a 5 km radius of the site recorded on Atlas of Living Australia (**Plan A9**). These date

back to 1992 with two records in 1994. Reviewing the above, the referral area is considered to provide some potential foraging habitat.

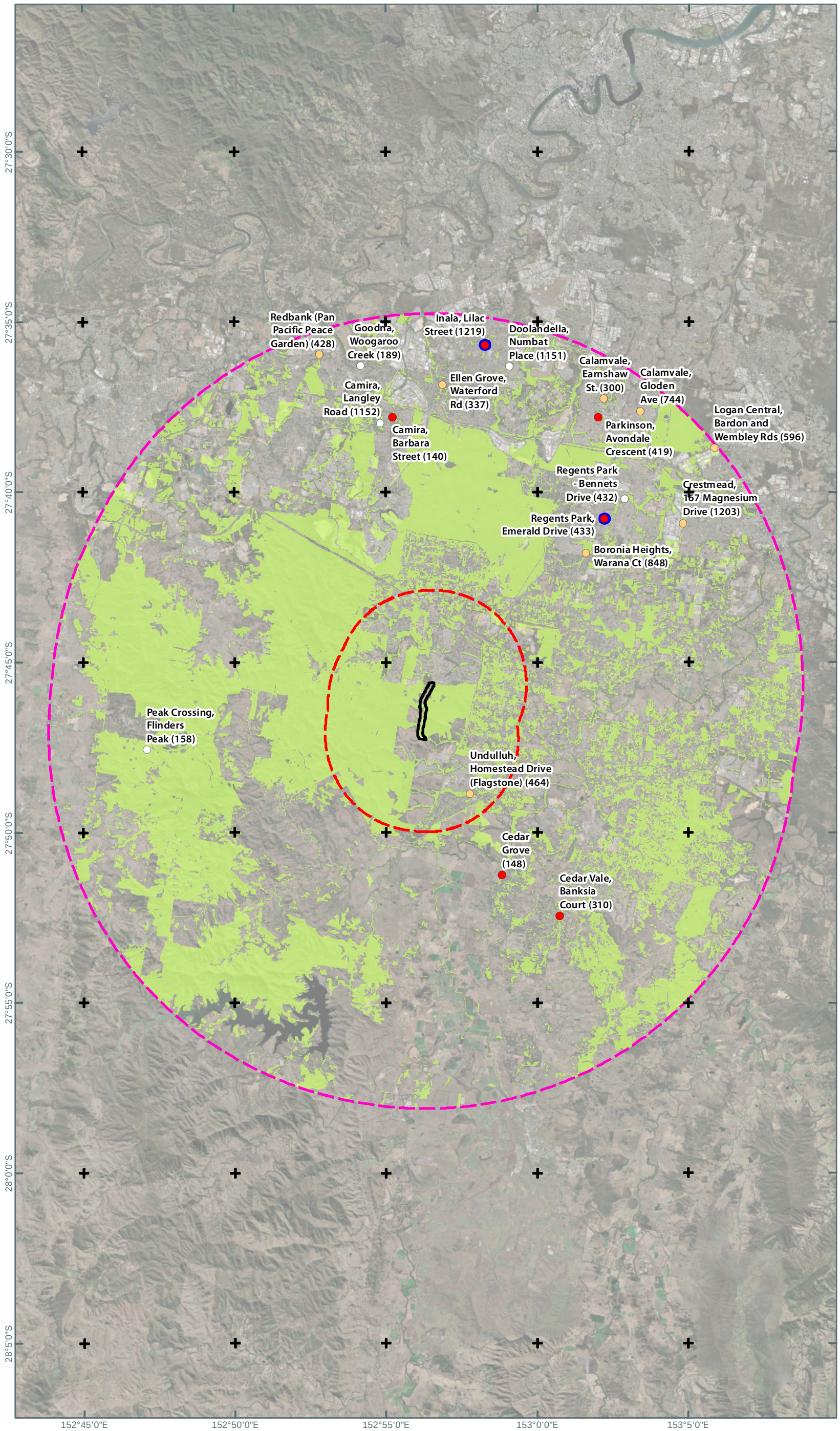
e. Conclusions on the likelihood of occurrence of listed threatened species and ecological communities within the project site, or within an area of impacts outside the project site'.

Field surveys confirmed the presence of potential foraging habitat for the GHFF on-site in the form of eucalypt woodland within the east and further west, with some fragmented eucalypt woodland present to the south. Species included *E. tereticornis* (Forest Red Gum), *C. intermedia* (Pink Bloodwood) and *E. siderophloia* (Grey Ironbark). In addition, suitable foraging vegetation occurs on-site with scattered *M. quinquenervia* species throughout the waterways which adjoin the New Beith Road reserve extent, however, the species the species was not seen utilising this vegetation during spotlighting surveys.

There are no observed roosts on-site, with the nearest roost located approximately 4 km south-east of the site at Homestead Drive (464), with the latest survey in August 2013. Flowering Eucalypts were present during spotlighting activities although the Grey-headed Flying-fox was not recorded.

Foraging habitat for the species was recorded on the site although there is higher quality habitat adjacent to the site in more contiguous patches of vegetation. There is a moderate likelihood that the species may opportunistically forage on-site.

A8. GREY-HEADED FLYING FOX ROOSTS AND POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Grey-headed Flying Fox habitat within 20km of referral area [39%]

Fed GHFF. Monitoring Program (2023)

- Grey-headed Flying Fox roost inactive within recent surveys [5]
- Grey-headed Flying Fox roost active within recent surveys [8]
- Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [4]
- Nationally significant Grey-headed Flying Fox roost active within recent surveys [0]
- Nationally significant Grey-headed Flying Fox roost active within recent surveys with a population level of 3 or above [2]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

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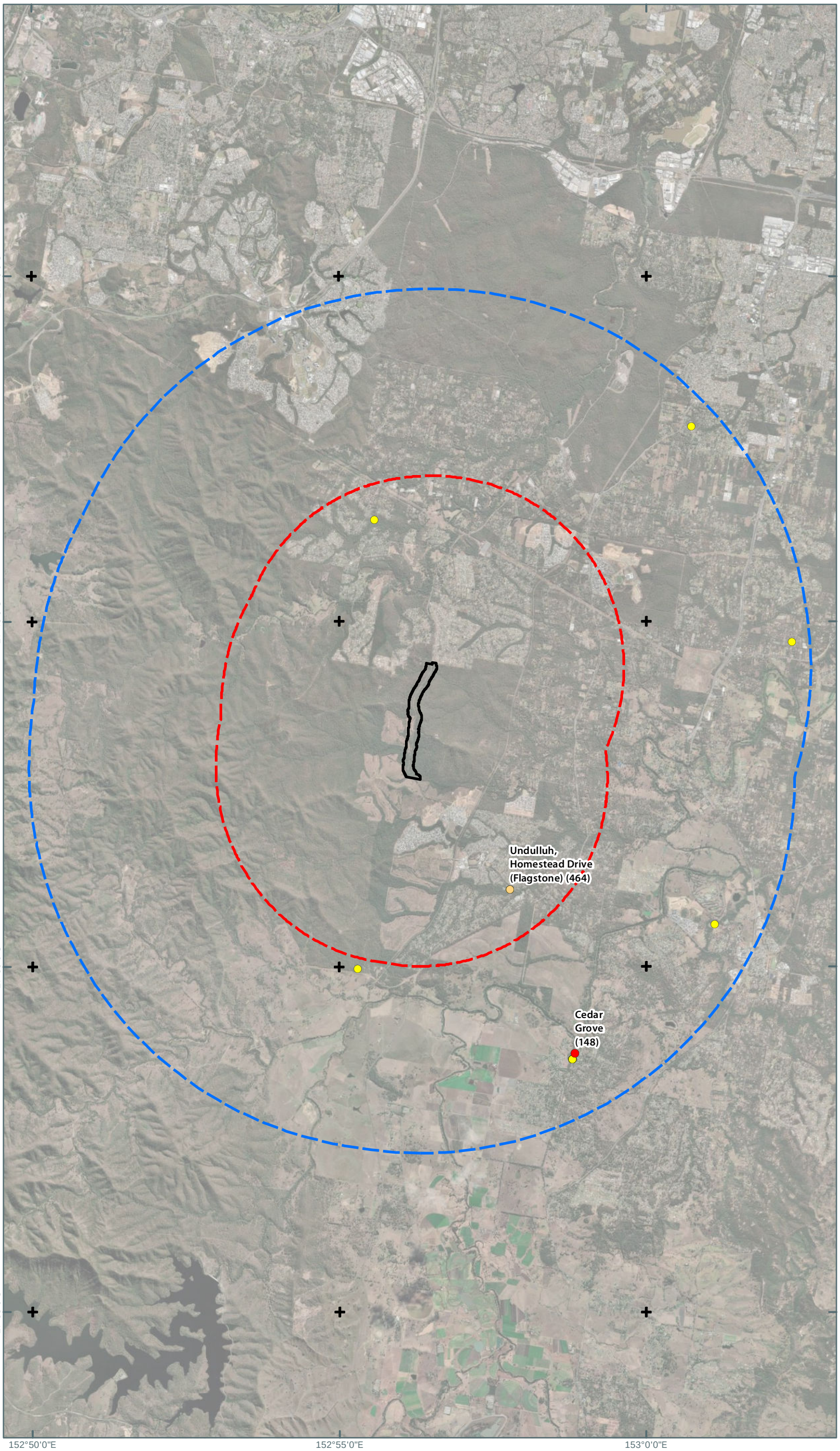
8418 E A8 NBR GHFF Roosts Records A

A9. GREY-HEADED FLYING FOX ROOSTS & OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Grey-headed Flying Fox records within 10km of referral area recorded within past 20 years [19]

Fed GHFF. Monitoring Program (2023)

- 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]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A9 NBR GHFF Records A

3.3.4. 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 km^2 to maintain viable populations (Eyre 2002).

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

As a result of historic modification and current road uses, the impact area is a comprised of a combination of remnant, regrowth and non-remnant vegetation. The species was not identified on-site during field survey effort.

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, fragmentated 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 from which they have been lost (DCCEEW, 2022).

Targeted spotlighting events were completed across the site, and the species was not observed. It is considered very unlikely that the species would readily recolonise the vegetation within the site, particularly within the non-remnant portions in the north. Areas of remnant vegetation occur within the southern portions of the impact site, however most are adjacent to cleared paddocks which provide limited connectivity value.

Greater Glider habitat within the broader landscape is predominately associated with the remnant vegetation. Habitat is located in the remnant vegetation patches within the impact site along with a broader contiguous patch to the west (refer **Plan A10**). This more preferrable habitat occurs in the west and is associated with and adjacent to existing conservation areas White Rock Spring Mountain Forest Park and Stewardale Nature reserve some with connectivity existing along Flagstone creek.

Habitat is also located to the east between the site and rail line, however it is worth noting the Flagstone PDA is earmarked for future development, increasing the disturbance within this area.

It is noted that Greater Glider are extremely sensitive to disturbance with the current road being utilised by 4WD and motorbike use in addition to dumping of rubbish which runs directly through the centre of the habitat present within the impact area.

Given the high levels of disturbance, existing modification and cleared areas across the subject site, and the abundance of more preferred habitat to the west of the site, the value of the habitat on site for Greater Glider is considered to be limited, particularly within the proposed impact area.

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

As discussed, the proposed impact area contains a mix of habitat values with the existence of large hollow bearing trees alongside the existing uncleared road reserve and cleared areas. Remnant, regrowth and non-remnant habitat values occur across the site with highly modified areas as a result of historical clearing, ongoing disturbances and road uses. As discussed, the vegetation on site consists of a variety of vegetation communities with different levels of maturity and disturbance. A significant portion of the site contains scattered large trees, largely dominated by regrowth Acacia species, offering little habitat value.

In addition to being particularly sensitive to fragmentation and disturbance, the species is not known to readily recolonise areas that have been subjected to historical disturbances. Therefore, the habitat on-site, particularly the existing cleared road reserve and regrowth vegetation within the proposed impact area, is not considered suitable habitat for the species in its current state, or into the future.

The WildNet search results show a single record of this species within a 5 km radius of the site. Atlas of Living Australia shows 4 records within 10km of the referral area recorded within the past 20 years, located in White Rock Conservation Park and Greenbank Military Training Area, which are highly vegetated areas with a high proportion of mature remnant eucalypts (refer **Plan A11**). As a result, it is expected there is a low probability that this species would occur on-site due to all records being located offsite over the past 20 years.

Due to the factors outlined above, the vegetation on-site is not considered likely to provide significant habitat for the species but notably it does support attributes listed as habitat critical to the survival of the species as outlined in the conservation advice. In the greater landscape, vegetation within Conservation and Forest Park Areas to the west are more likely to provide suitable critical habitat for the species.

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

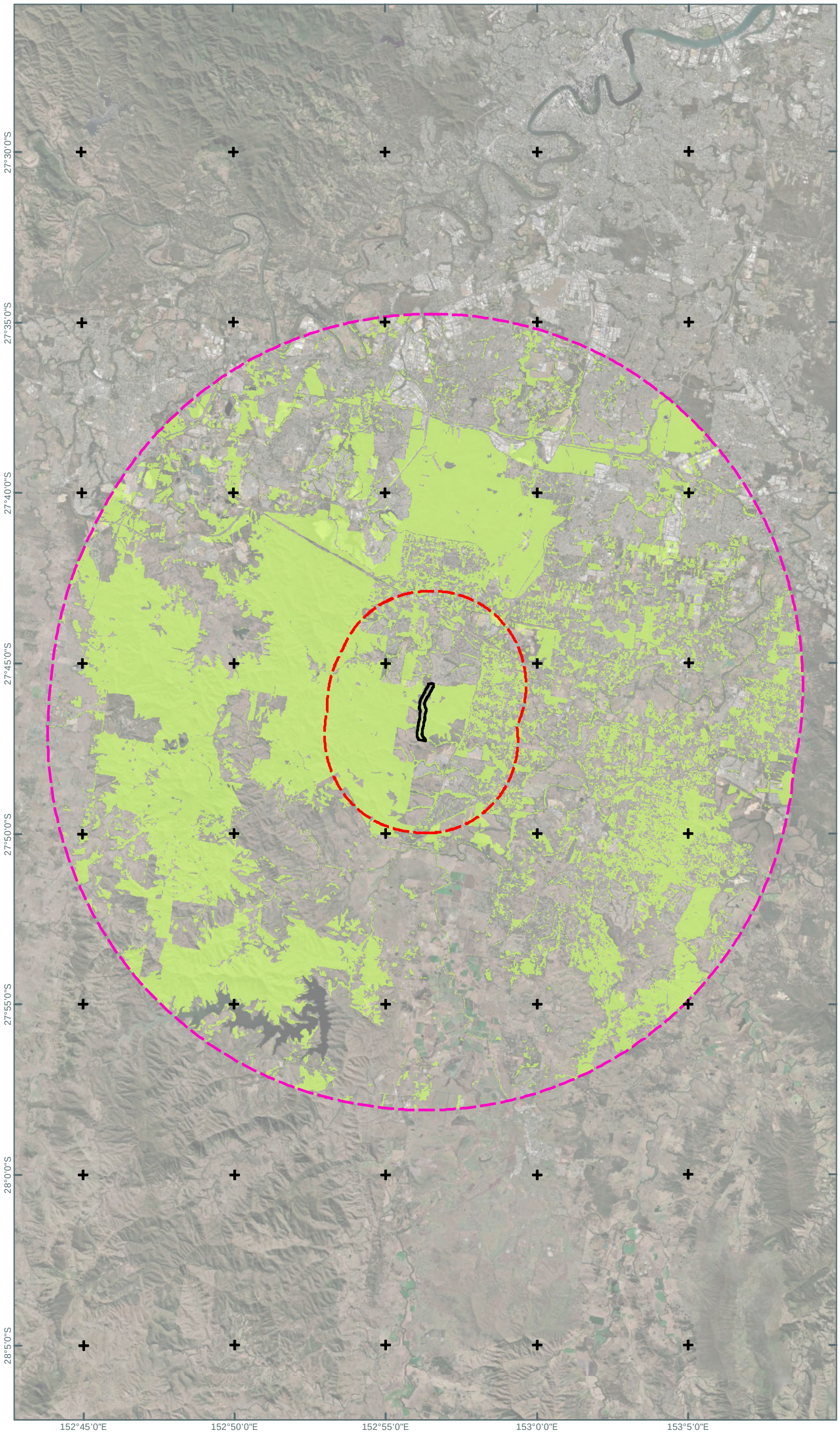
As depicted in **Plan A11** no records of Greater Glider occur within 5 km of the site within the last 20 yrs. Four (4) records occur when the search radius is extended to 10 km with the records predominately occurring within contiguous vegetation areas Greenbank Military Training Area in the north and to the west towards White Rock – Spring Mountain Conservation Park. Wildnet Records shows one (1) record of Greater Glider within 5 km of the site dating back to 1994. According to the Queensland BioMaps local records for the species includes only one (1) sighting from 1994. Furthermore, no evidence of Greater Glider was noted throughout extensive field survey effort and targeted spotlighting surveys.

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

No Greater Glider individuals were observed during any of the field surveys conducted. As previously discussed, limited records of the species occur within the broader landscape, with existing records located within more contiguous vegetation patches away from disturbance.

Considering the patchy distribution of habitat available within the impact area, considerable disturbance throughout the site and greater quality of vegetation located within the broader landscape, it is considered unlikely that the Greater Glider will occur on the site.

A10. GREATER GLIDER POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Greater Glider habitat within 20km of referral area [39%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

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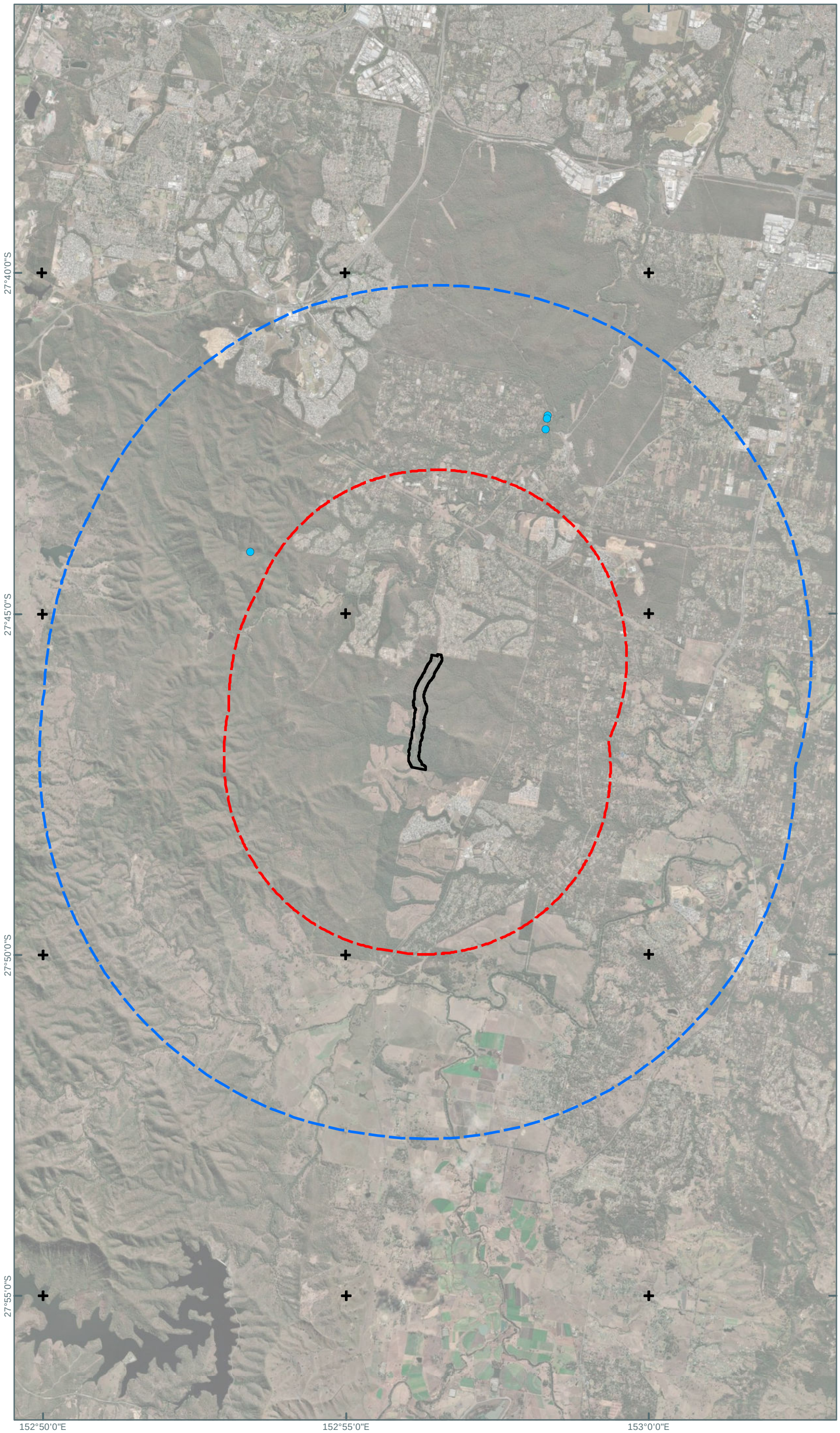
8418 E A10 NBR GG Habitat A

A11. GREATER GLIDER OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer

Greater Glider Records (ALA/WildNet 2024)

- Greater Glider (Central) records within 10km of referral area recorded within past 20 years [4]
- Greater Glider (Northern) records within 10km of referral area recorded within past 20 years [0]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A11 NBR GG Records A

3.3.5. South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*)

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

Distribution

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

Ecology

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

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

Habitat

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

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

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

As a result of historic modification and current road uses, the impact area is a comprised of a combination of remnant, regrowth and non-remnant vegetation. Preferable habitat is located within the mapped remnant vegetation areas, which contain some mature hollow bearing trees (refer **Plan A12**).

Habitat in the northern extent of the impact site is limited, characterised by predominately mapped non-remnant vegetation, with regrowth vegetation also present intermittently. The mapped remnant areas are located in the southern-western portion and provide some habitat value. Of the mapped remnant REs present, the desired food trees *Allocasuarina* and *Casuarina* spp. are not dominant or listed within the description of species usually composing the ecosystem (refer **Table A5**).

It is worth noting that a cleared area is located through the centre of the impact site characterised by the existing New Bieth Road, which is utilised for 4WD and motorbike use, in addition to dumping of rubbish.

Some connectivity between areas of potential habitat occur in the east with a polygon of remnant vegetation. However, as part of the Flagstone PDA, this area is earmarked for future development and is bordered by residential areas and high traffic roads. Within the broader landscape more contiguous preferrable habitat occurs to the west in association with existing conservation areas White Rock Spring Mountain Forest Park and Stewardale Nature reserve with some connectivity existing along Flagstone creek. Fauna movement solutions are proposed to be implemented in association with the creek in the lower portion of the site.

Given the high levels of disturbance, patchy distribution of preferred habitat and more contiguous vegetation areas located in the west of the site, the value of the habitat on site for Glossy Black-cockatoo is considered to be limited, particularly within the proposed impact area.

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

The preferential habitat as referenced in the DCWE Conservation Advice includes large hollows in living and dead eucalypts as well as food options in the form of she-oak seeds (*Allocasuarina* spp. and *Casuarina* spp.) Across the remnant mapping within the impact area and buffer neither food species tree was listed within the description of the regional ecosystem compositions that were present (refer **Table A5**). During field survey some food trees in the form of *Allocasuarina littoralis* (Black-She-oak) were noted, however, no evidence of Glossy Black-cockatoo feeding behaviour was observed. Some large mature trees with appropriately large hollows were noted within the buffer area, however, they were relatively limited.

The preferred habitat within the impact area and broader context of the site exhibits a scattered distribution, with a mix of remnant, regrowth and non-remnant vegetation values. As previously discussed, this is also limited through the centre of site as a result of the cleared road reserve. It is expected that preferential foraging a breeding vegetation is located more broadly within the Conservation and Nature Refuge areas associated with the contiguous patch of remnant vegetation to the west of site (**Plan A12**).

It is considered the vegetated areas along the impact site and within the buffer would provide opportunistic foraging habitat for the species, regardless of the condition, though unlikely considering the higher quality vegetation located in the broader landscape.

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

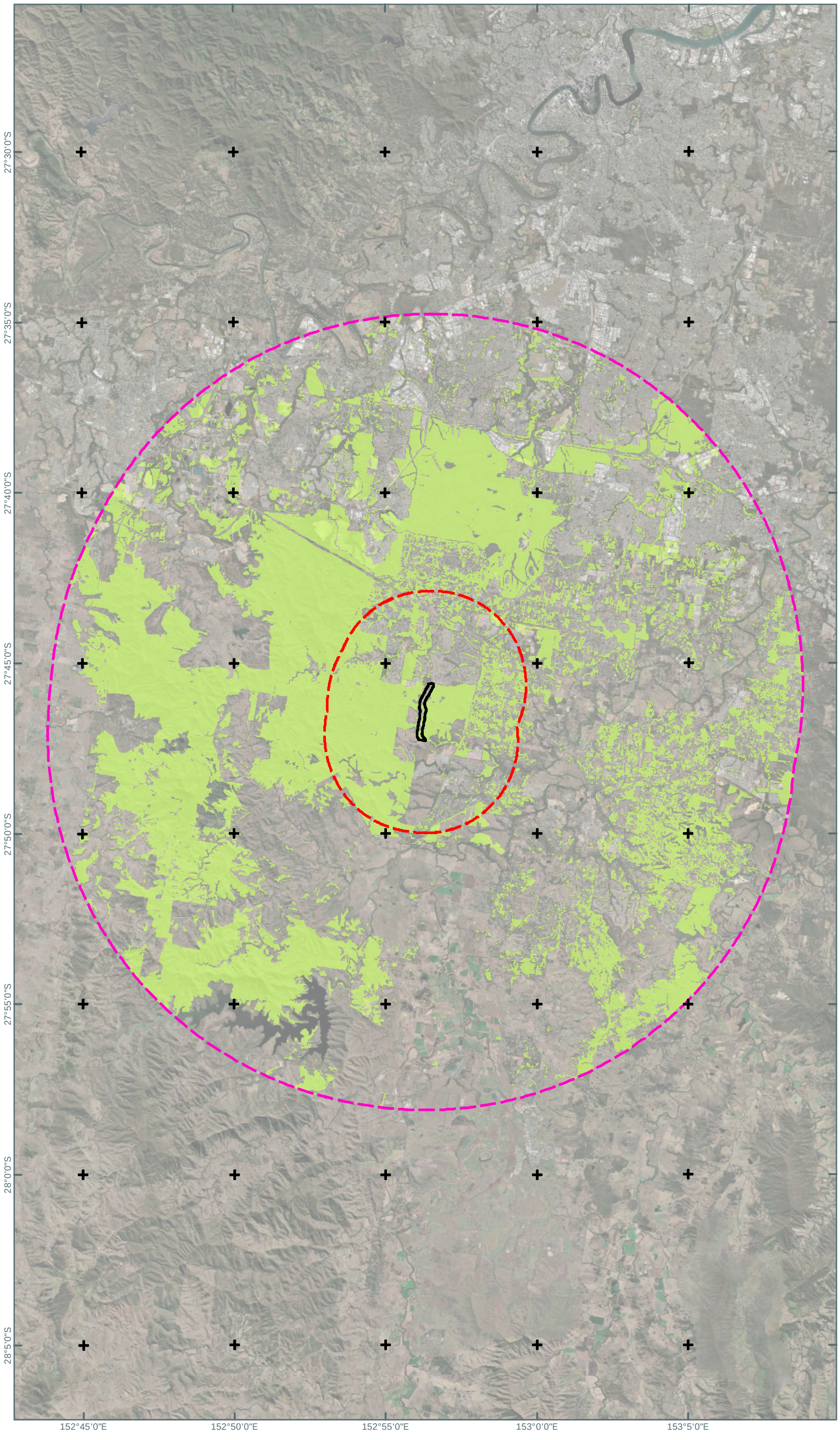
Occurrence records of the Glossy Black-cockatoo are scattered around the broader landscape with only one (1) record within a 5km radius of the referral area over the last 20 years (refer **Plan A13**). This record is located north-east of site and dates back to 2013. Within 10km of the site 24 records were noted. These records were primarily located towards the north-east of site, which is amongst areas currently characterised by residential development. Records are also found within the vegetated areas to the west of the impact site.

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

No evidence of the species occurring onsite were noted throughout the extensive field surveys suggesting the Glossy Black-cockatoo is not utilising the site for roosting or foraging. The WildNet search results show no records of this species within a 5 km radius of the site, with Atlas of Living Australia displaying one (1). Past observations of the species have predominately been located to areas north and east of the site, with additional records within the highly vegetated areas of White Rock Conservation Park Greenbank Military Training Area and Stewartdale Nature Refuge. The broadly scattered records in the landscape contribute to the likelihood of the species to be observed as a fly-over or opportunistic forager, rather than roosting or breeding behaviour.

Considering the patchy distribution of habitat available within the impact area, considerable disturbance throughout the site and greater quality of vegetation located within the broader landscape, it is considered unlikely that the Glossy-Black Cockatoo will occur on the site especially considering the relatively narrow area and buffer.

A12. GLOSSY BLACK-COCKATOO POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Glossy Black-cockatoo habitat within 20km of referral area [35%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

1:210,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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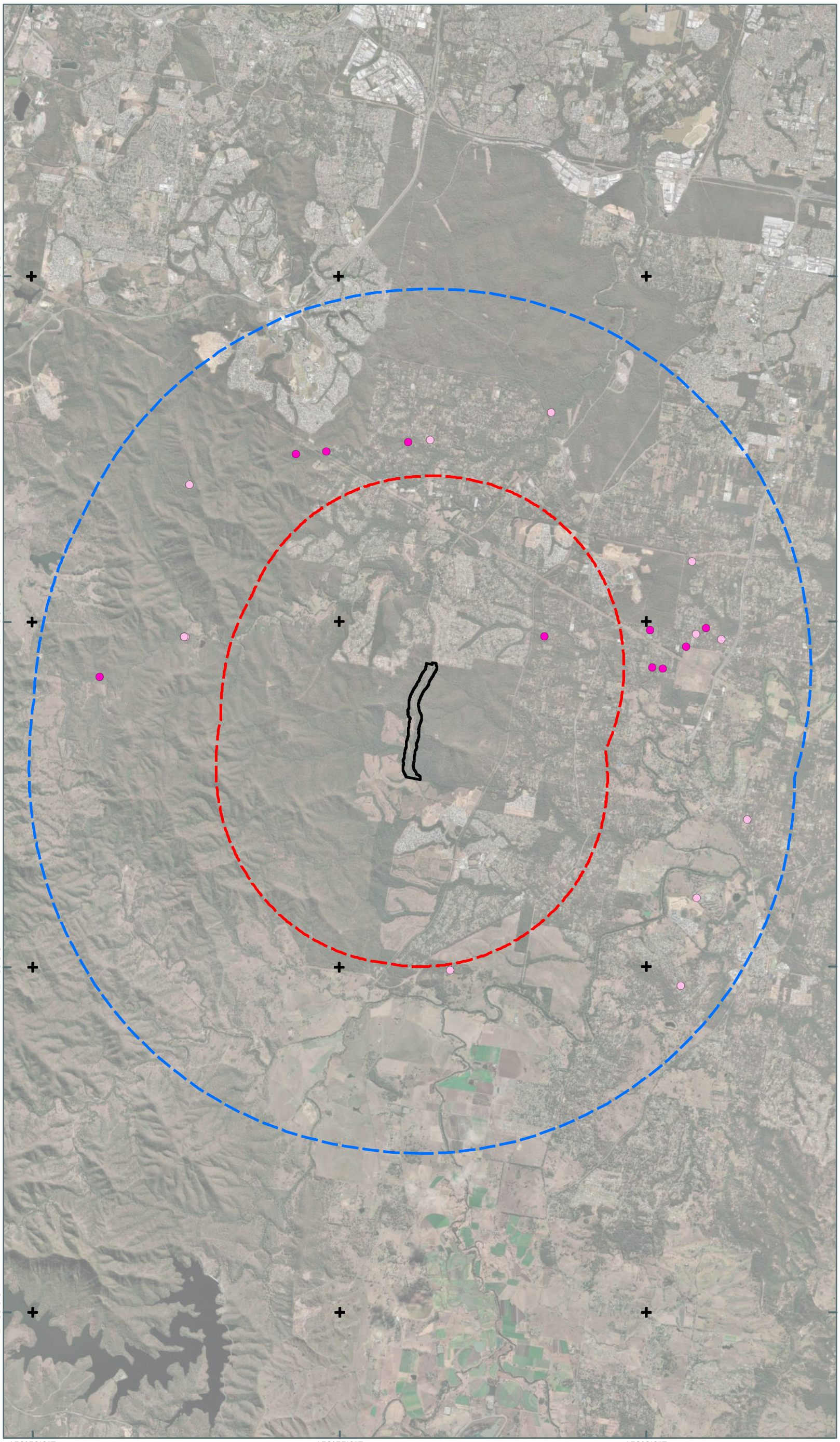
8418 E A12 NBR GBC Habitat A

A13. GLOSSY BLACK-COCKATOO OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer

Glossy Black-cockatoo Records (ALA/WildNet 2024)

- Glossy Black-cockatoo records within 10km of referral area recorded within past 20 years [14]
- South-eastern Glossy Black-cockatoo records within 10km of referral area recorded within past 20 years [10]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
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N

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8418 E A13 NBR GBC Records A

3.3.6. Swift Parrot (Lathamus discolor)

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

Abundance

The population size is estimated to be less than 2,500 birds, with less than 1,000 breeding pairs known[2].

Distribution

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

Habitat and Ecology

The Swift Parrot is predominantly bright green in colour, with dark-blue patches on the crown, a prominent red face, and the chin and throat are narrowly bordered with yellow. It is approximately 25 cm in length, the wingspan is 32-36 cm and it weight approximately 65 g. It is a slim, medium-sized parrot with angular pointed wings and a slender tail giving it the characteristic streamlined flight-silhouette.

Swift parrots breed in tree-hollows in old-growth or other forest with suitable hollows, in relatively close proximity to the main food source, flowering Tasmanian blue gum. Several pairs often nest nearby, in the same or neighbouring trees. Breeding success is correlated with the intensity and extent of flowering, which is highly variable between years. In poor years, swamp (black) gum (*Eucalyptus ovata*) is used as food source.

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

[2] Saunders, D., Tzaros, C., Webb, M. and Thurstans, S. (2010). Background Document - Swift Parrot Recovery Plan. Department of Environment, Climate Change and Water, Queanbeyan, and Birds Australia.

melliodora, Eucalyptus robusta and *Eucalyptus tereticornis* (refer **Table A7**). The species prefers large trees that flower consistently.

Table A7: Foraging habitat types for Swift Parrot – Queensland

Key tree species – common name	Key tree species – scientific name	Queensland
Grey Box	*Eucalyptus microcarpa*	South-east (Border Rivers Maranoa-Balonne, Condamine, South East Queensland, Burnett Mary)
Yellow Box	*Eucalyptus melliodora*	South-east (Border Rivers Maranoa-Balonne, Condamine, South East Queensland, Burnett Mary)
Swamp Mahogany	*Eucalyptus robusta*	South-east (Burnett Mary, South East Queensland)
Forest Red Gum	*Eucalyptus tereticornis*	South-east (Border Rivers Maranoa-Balonne, Condamine, South East Queensland, Burnett Mary)

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

The species was not identified on-site nor as fly-over during field survey effort. Some potential foraging habitat was noted within the referral area, with species such as *C. citriodora* and *E. tereticornis* recorded on-site as the dominant species in two remnant regional ecosystems noted as occurring. However, these were largely located in the impact buffer with larger foraging trees located further outside the impact area. The species is known to have a preference for foraging in large, mature trees. Due to historical disturbances, small diameter eucalypts under 300 DBH were the dominant vegetation. Specific bird surveys and ground-truthing of potentially suitable habitat on-site and along the abutting boundaries was completed during field survey efforts.

Plan A14 demonstrates the potential habitat for Swift Parrot within the context of the impact site using preferred foraging species as detailed within the Swift Parrot Recovery Plan (Saunders and Tzaros, 2011) and Draft Swift Parrot Recovery Plan (DAWE, 2021). This includes the preferred foraging species and species known to support a DBH greater than 300 mm as these trees are more productive than smaller trees.

The impact site is characterised as a linear highly modified road reserve which is subject to ongoing modification and use with the impact buffer area dominated by small diameter, mature trees amongst dense acacia regrowth in the buffer. In addition, larger intact strands of remnant vegetation in the greater landscape of South East Queensland, closer to known records (provided on **Plan A15**).

Habitat for the Swift Parrot is limited to the winter flowering foraging species on-site, in particular, large *C. citriodora* and *E. tereticornis*. Due to historical land management practices, the presence of large trees is anthropologically influenced, where *C. citriodora* and *E. tereticornis* dominate the site, very large more

productive trees targeted for foraging are scattered. Therefore, the habitat on-site is to be considered limited, as shown in **Plan A14**.

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 (*Lathamus discolor*) (Saunders & Tzaros, 2011) 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". Furthermore more favourable habitat with greater connectivity is located in the in White Rock-Spring Mountain Conservation Estate (north west) and Flinders-Goolman Conservation Estate (west).

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

The significance of foraging habitat located on-site within the impact area and buffer area are considered marginal given the abundance of more preferable habitat closer to current records and within broader landscape. Further as stated in the Federal DCCEEW Conservation Advice, non-breeding birds preferentially feed on inland box-ironbark and grassy woodlands in *Eucalyptus robusta* (Swamp Mahogany) and *Corymbia maculata* (Spotted Gum) woodland of which were not present within the referral area (although *C. citriodora* is). Essential habitat is not identified on-site under the VMA.

Potential habitat for the Swift Parrot is limited to the winter flowering foraging species on-site, in particular, large *C. citriodora* and *E. tereticornis*. Due to historical land management practices, the presence of large trees is anthropologically influenced, where *C. citriodora* and *E. tereticornis* dominate the site, very large more productive trees targeted for foraging are scattered. Therefore, the habitat on-site is to be considered limited.

The placement of the site within an urban context also increases the prevalence of aggressive nectarivorous birds including *Manorina melanocephala* (Noisy Miner) and *Trichoglossus moluccanus* (Rainbow Lorikeet) which were confirmed on-site during field surveys. The dominance of smaller diameter trees and the lack of large preferential foraging trees limits the quality of habitat within the referral area.

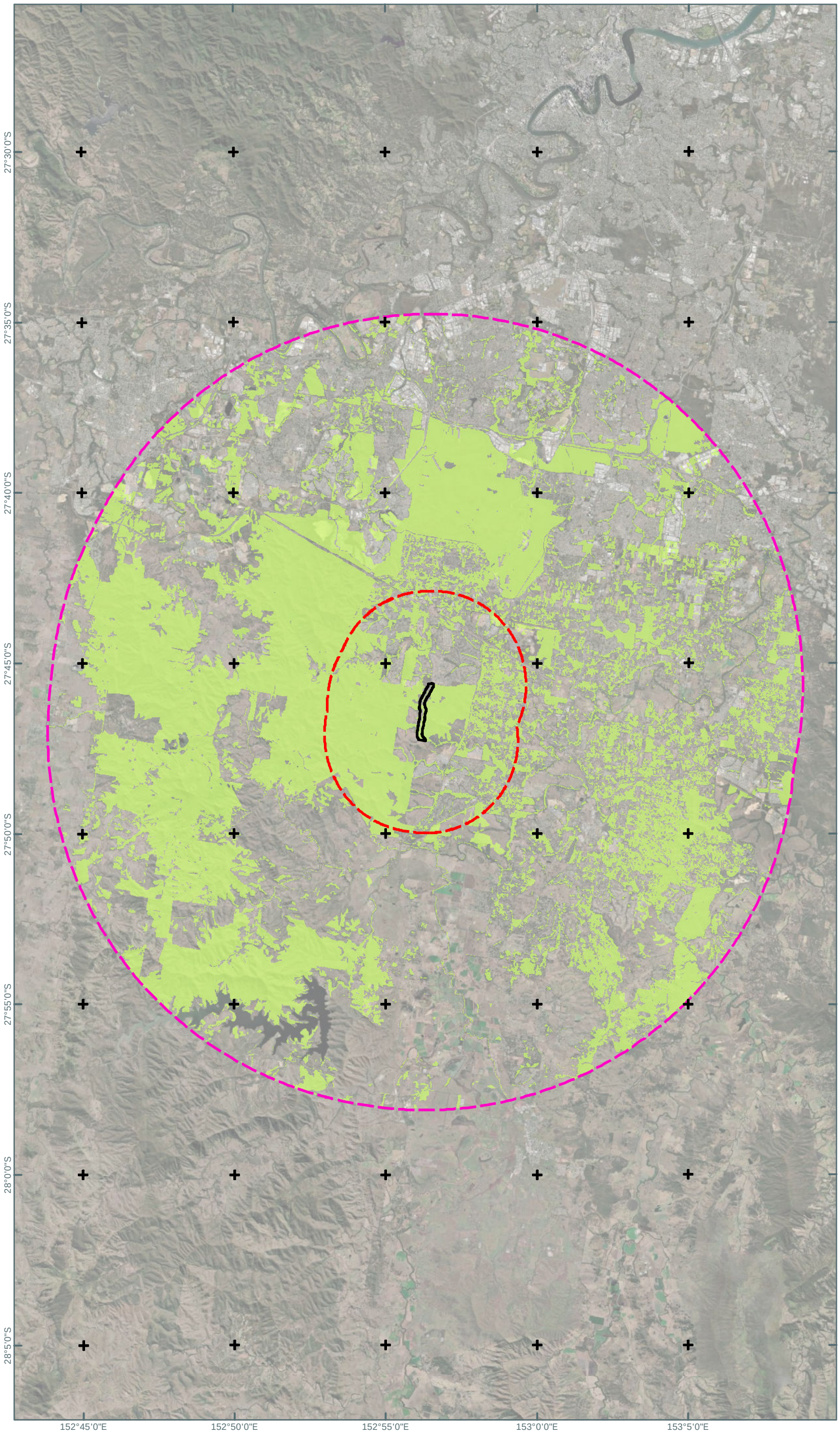
d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

There are no recent records of the species within 5 km or 10 km of the subject site within the last 20 years on the ALA Database (**Plan A15**). With an extended search to 20 km of the subject site 27 records exist, all located to the north with the most recent records in 2019. In addition, the site is located proximally to continuous, higher quality foraging habitat adjacent to the White Rock-Spring Mountain Conservation Park with Flinders-Goolman Conservation estate to the south-west. More favourable habitat located offsite reduces the potential Swift Parrot would utilise the impact site vegetation preferentially. Any occurrence would be limited to opportunistic foraging. Notably, the recovery plan states that habitat critical to the survival of the Swift Parrot includes all preferred foraging species within known and likely foraging habitat on the mainland. As the site maintains potential foraging resources for the species that will be impacted, a significant impact may occur.

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

The vegetation onsite includes inconsistent habitat values which is in contrast to the high value contiguous vegetation located to the north and west of the site. In addition, active disturbance throughout the centre of the impact area and competitive species onsite provide a deterrent. in addition, the lack of local records of the species within the last 20 years or evidence of the species throughout field survey efforts it is considered highly unlikely Swift Parrot would utilise the site.

A14. SWIFT PARROT POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Swift Parrot habitat within 20km of referral area [39%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

1:210,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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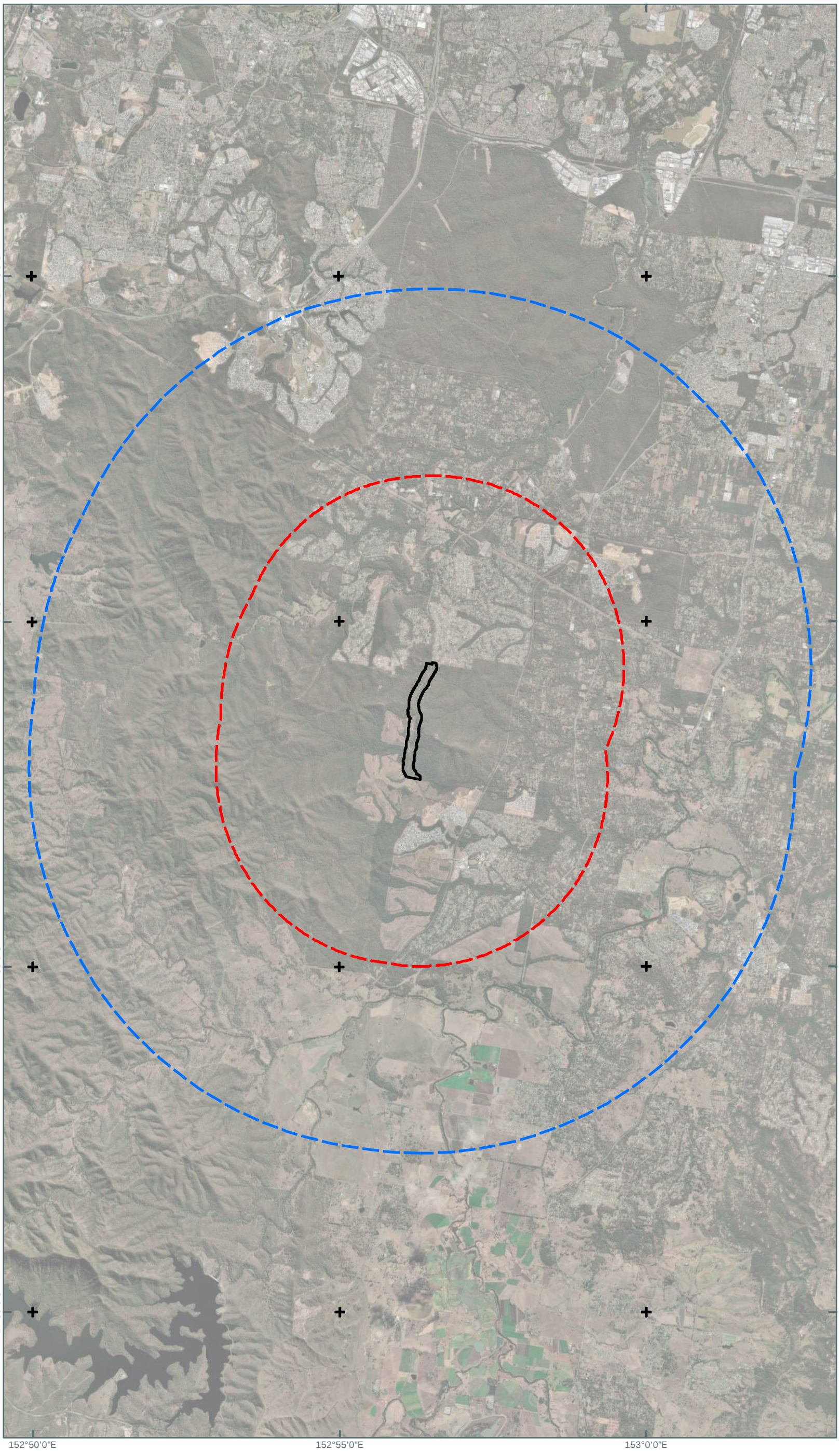
8418 E A14 NBR SP Habitat A

A15. SWIFT PARROT OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Swift Parrot records within 10km of referral area recorded within past 20 years [0]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

1:105,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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8418 E A15 NBR SP Records A

3.3.7. Regent Honeyeater (*Anthochaera phrygia*)

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

Distribution and Abundance

The Regent Honeyeater is endemic to mainland south-eastern Australia. It has a patchy distribution which extends from south-east Queensland, through New South Wales (NSW) and the Australian Capital Territory (ACT), 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 NSW and one in Victoria.

The species range and numbers have contracted greatly since about the 1940s. It previously ranged from near Rockhampton in Queensland to Wilmington in South Australia. It was last recorded in South Australia in 1977 and is now probably extinct in that state. There were reports of 'immense' numbers and 'very large flocks' in the early 20th century, but flocks of more than 30 birds are now uncommon.

Habitat and Ecology

The Regent Honeyeater is a striking, predominantly black and yellow bird. Its head and neck are black, with warty pink or yellow skin around the eyes. The upperparts of its body are black and heavily scalloped with pale yellow. The breast and upper belly are black with a pale yellow to white V-shaped pattern, and the lower belly is a pure pale yellow. The wing and tail feathers have broad yellow edges.

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 sheoak (*Casuarina spp.*) 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.

The Regent Honeyeater's diet primarily consists of nectar, but also includes invertebrates (mostly insects) and their exudates (e.g. lerps and honeydew), and occasionally fruit. Its time spent foraging for nectar ranges from 10% to 90% depending on availability. It obtains nectar chiefly from eucalypts and mistletoe, and appears reliant on select species which provide reliable nectar flows. It prefers taller and larger diameter trees for foraging, as these typically produce more nectar. Key tree species for the Regent Honeyeater include *Eucalyptus sideroxylon, Eucalyptus melliodora, Eucalyptus albens, Eucalyptus leucoxylon, Corymbia maculata/citriodora, Eucalyptus robusta, Casuarina cunninghamiana, Amyema cambagei* and *Dendropthoe vitellina*.

The species' movement patterns are thought to be governed by the flowering of select eucalypt species. It is nomadic and partly migratory, with some predictable seasonal movements observed. The species is highly mobile and capable of travelling large distances, however the regularity and extent of long-distance movements are unknown. Aggregations historically occurred at nectar sources, mostly during autumn and

winter, but these events are now rare. The species roosts communally in small groups or large flocks, in trees with dense foliage. Foraging trees are rarely used as roosting sites.

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

Detailed habitat surveys on-site were conducted to identify potentially suitable habitat for the Regent Honeyeater. The species was not identified on-site during field survey events; however, one foraging species was recorded within the subject site, being *Corymbia citriodora*. Desktop assessment of suitable habitat within the broader landscape finds the majority of contiguous high-quality habitat located towards the north and west of site (refer **Plan A16**). These areas are adjacent to existing conservation and nature refuge areas. Habitat towards the east and south are limited due to residential development as part of the Flagstone PDA which is likely to increase.

A number of factors reduce the suitability of this site as potential foraging habitat. Historical disturbance including current road use provides an active deterrent to the vegetation within the impact area. Additionally, Regent Honeyeaters are known to be outcompeted by aggressive birds such as the Noisy Miner (*Manorina melanocephala*), a species which was observed utilising the vegetation on-site.

Analysis of Regent Honeyeater records within the landscape over the last 20 years found only 8 records across 3 locations within 10 km (refer to **Plan A17**). This suggests an existing population of the species is not present within the context of the site.

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

This species prefers the wettest, most fertile sites within box-ironbark associations such as along creek flats, broad river valleys and foothills.

The National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) identifies the key tree species and mistletoe species as the following:

- Mugga (or Red) Ironbark (*Eucalyptus sideroxylon*).
- Yellow Box (*E. melliodora*).
- White Box (*E. albens*).
- Yellow Gum (*E. leucoxylon*).
- Spotted Gum (*Corymbia maculata*).
- Swamp Mahogany (*E. robusta*).
- Needle-leaf Mistletoe (*Amyema cambagei*) on River Sheoak (*Casuarina cunninghamiana*) – flowers winter to early summer (June to December).
- Box Mistletoe (*A. miquelii*) - flowers summer to autumn (December to May).
- Long-flower Mistletoe (*Dendropthoe vitellina*) – flowers in November to March (spring to autumn).

Most records of Regent Honeyeaters come from box-ironbark eucalypt associations, where the species seems to prefer more fertile sites with higher soil water content (including creek flats, broad river valleys and lower slopes)[3]. Other forest types regularly utilised by Regent Honeyeaters include wet lowland coastal forest dominated by Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum-Ironbark associations and riverine woodlands (where it is known to feed on nectar from *Amyema cambagei*)[3]. The approved conservation advice for Regent Honeyeater (*Anthochaera phrygia*) provides detailed habitat descriptions which was utilised in preparation of assessing the proposed action area.

The National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) identifies key breeding areas, other breeding areas and the areas where species 'may' or are 'likely' to occur. The proposed action area is not within nor proximal to identified breeding areas.

Field survey involved detailed assessment of vegetation on-site, with a focus on recognising species which are known as key tree / mistletoe species or preferred habitat. As discussed, limited preferred foraging species were recorded across the site. No other tree species listed as being key species were identified during field survey effort. The species that were recorded across the site are considered to provide limited suitable habitat if the Regent Honeyeater choose to utilise it.

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

Due to the sensitivity of this species, the Queensland Department of Environment and Science do not release official record details of this species, as such, a public database platform had to be utilised to analysis historical records of the species within a 5 km radius of the proposed action area. Three (3) records of the species are located within the 5 km radius of the proposed action area on ALA, with the most recent observation occurring in 2021 (**Plan A17)**. There are 8 (within the past 20 years, across 3 sites) located within a 10 km radius of the referral area where Regent Honeyeater(s) have been recorded.

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

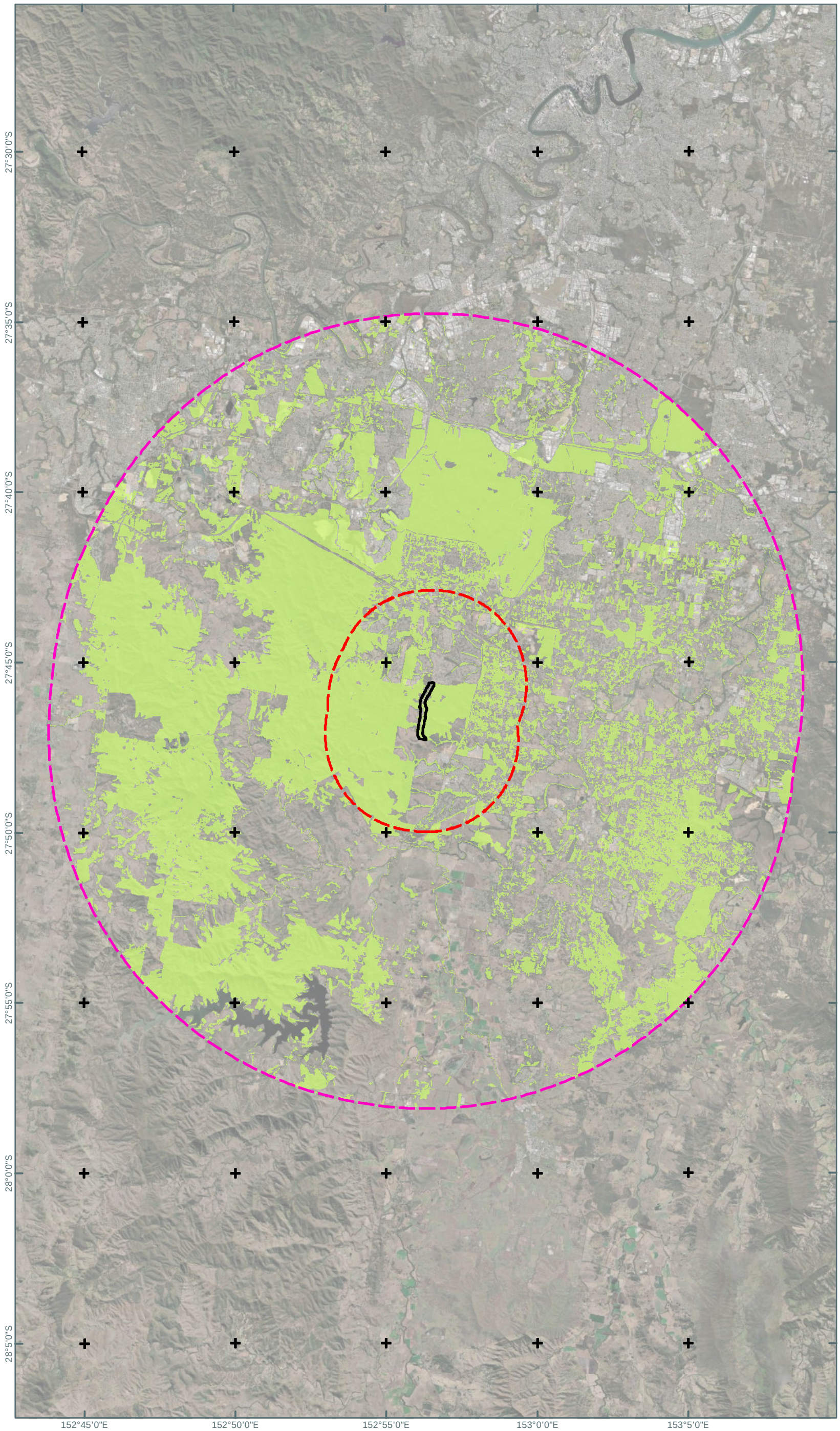
The New Bieth Road reserve impact area and buffer are mapped as a combination of Category C (non-remnant) and Category B (remnant) under the Vegetation Management Act 1999 (QLD). The area includes a range of habitat values with some areas of preferred habitat for Regent Honeyeater along the linear impact area and buffer in the form of *Corymbia citriodora* (Spotted Gum). Cleared areas and non preferrable habitat occurs in the north along with various cleared areas throughout the impact site in association with the existing road parcel. The area experiences high levels of disturbance from vehicle and motorbike uses, along with dumping of rubbish, likely to deter foraging activity.

[3] *National Recovery Plan for the Regent Honeyeater (Anthochaera phrygia*), Commonwealth of Australia 2016.

Connectivity between the site and other areas of vegetations occurs to the east, however, this is likely to decrease with clearing associated with the Flagstone PDA, earmarked for future development. More favourable habitat occurs in the contiguous patch of vegetation to the west of site however there is less connectivity with this habitat and the impact site.

Furthermore, no evidence of the species occurring onsite were noted throughout the extensive field surveys, nor recent records suggesting the Regent Honeyeater is not utilising the site.

A16. REGENT HONEYEATER POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Regent Honeyeater habitat within 20km of referral area [39%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

1:210,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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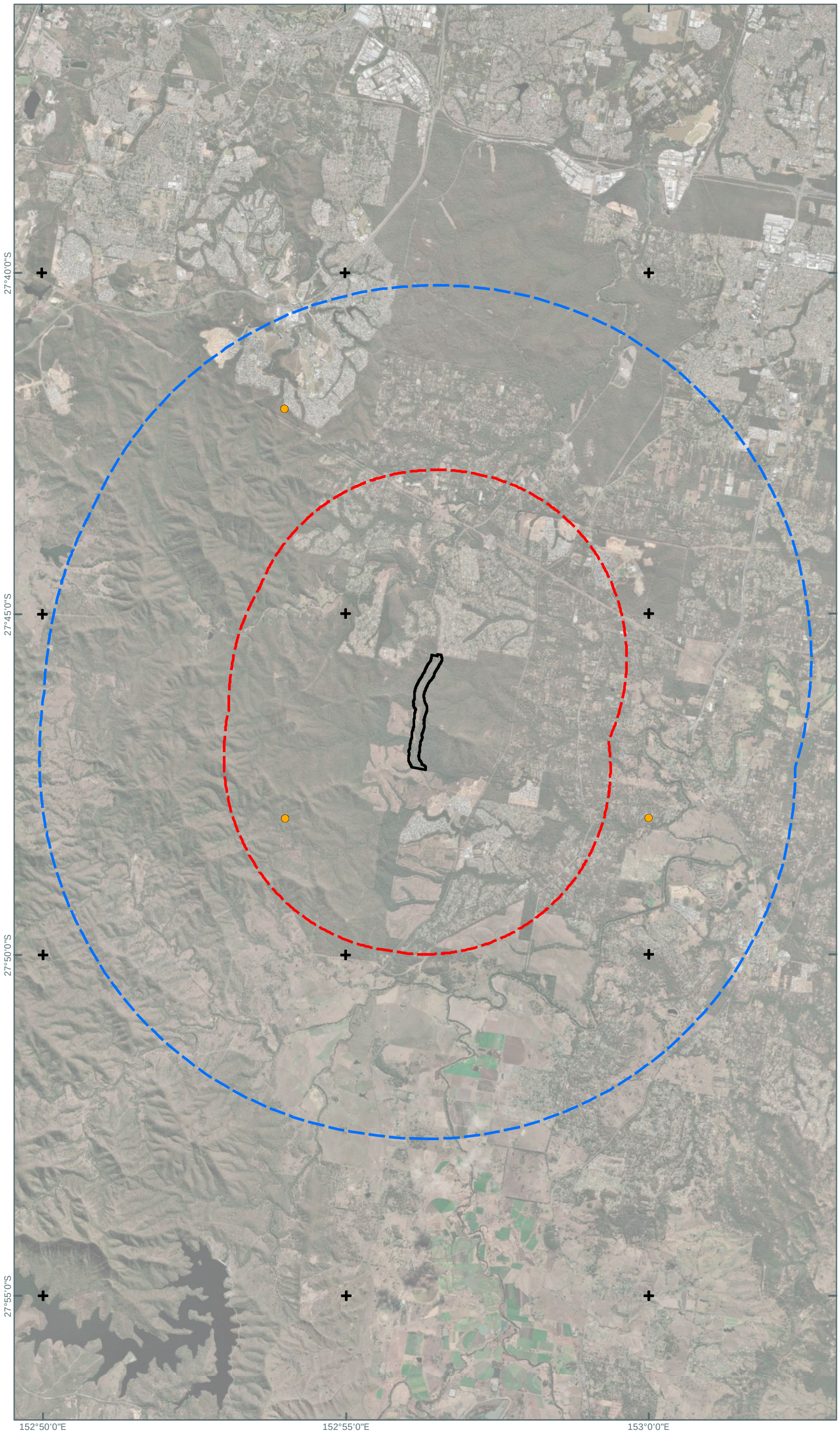
8418 E A16 NBR RH Habitat A

A17. REGENT HONEYEATER OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Regent Honeyeater records within 10km of referral area recorded within past 20 years [8]

Note: Records are generalised on a grid system for the protection of the species.

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A17 NBR RH Records A

3.3.8. Yellow-bellied Glider (Petaurus australis australis)

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

Distribution

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

Habitat and Ecology

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

The yellow-bellied glider (south-eastern) is nocturnal. It is active for most of the night and devotes 90 percent of the time spent outside the den to foraging-related activities. The subspecies is social and lives in family groups of two to six individuals (though usually three to four) of varying age and sex composition, throughout an exclusive home range of approximately 50–65 ha (plausible range 25–85 ha). Home ranges are necessarily large, because the trees used as foraging substrates are dispersed and use of trees can vary through time and space. During the day, the yellow-bellied glider (south-eastern) shelters in hollows found in large, old trees, usually more than one metre in diameter.

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

As a result of historic modification and current road uses, the impact area is a comprised of a combination of remnant, regrowth and non-remnant vegetation (**Figure A4**). Habitat in the northern extent is limited, characterised by predominately mapped non-remnant vegetation. The mapped remnant areas are located in the south-western area, however they are limited and mostly adjacent to cleared paddock areas. A cleared area is located throughout the centre of the impact area characterised by the existing New Bieth Road which is utilised for 4WD and motorbike use in addition to dumping of rubbish. It is noted that Yellow-Bellied Gliders are sensitive to disturbance.

Within the broader landscape more contiguous preferrable habitat occurs to the west of site in association with existing conservation areas White Rock Spring Mountain Forest Park and Stewardale Nature reserve some with connectivity existing along Flagstone Creek (refer **Plan A18**). Fauna movement solutions are proposed to be implemented in association with the creek in the lower portion of the site. An existing patch of habitat occurs to the east, however this is adjacent existing residential development as part of Flagstone PDA, which is likely to increase in future.

Given the high levels of disturbance, existing modification and cleared areas across the subject site, and the abundance of more preferential habitat to west, the value of onsite habitat for Yellow-Bellied Glider is considered to be limited, particularly within the proposed impact area.

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

As discussed, the proposed impact area contains a mix of habitat values with the existence of large hollow bearing trees alongside the existing road reserve and cleared areas. Remnant, regrowth and non-remnant habitat values occur across the site with highly modified areas as a result of historical clearing, ongoing disturbances and road uses. The vegetation on site consists of a variety of vegetation communities with different levels of maturity and disturbance.

In addition to being particularly sensitive to fragmentation and disturbance, the species is not known to readily recolonise areas that have been subjected to historical disturbances. Therefore, the habitat on-site, particularly the existing cleared road reserve and regrowth vegetation within the proposed impact area, is not considered suitable habitat for the species in its current state, or into the future.

Due to the requirement for large areas of contiguous forest, large areas of floristically diverse eucalypt forest dominated by winter flowering and smooth barked eucalypts are preferred habitat for Yellow-Bellied Gliders. Based on the REs noted as occurring within and adjacent to the impact area including RE 12.9-10.2, 12.9-10.7, 12.3.11 and 12.3.7. The dominant species include a range of smooth-barked and winter flowering species for sap use including *E. tereticornis* and *C. citriodora*.

Remnant areas are likely to hold greater value in the form of large hollow bearing eucalypt forests. Within the site this is somewhat limited. More favourable habitat values exist towards White Rock – Spring Mountain Conservation Park and Stewartdale Nature Refuge in the west, which offer more contiguous vegetation with a greater proportion of abundant floristically diverse mature Eucalypts and a larger proportion of living hollow bearing and sap trees. This is also more likely to facilitate dispersal of the species between habitat patches.

Due to the factors outlined above, the vegetation on-site is not considered likely to provide significant habitat for the species but notably it does support attributes listed as habitat critical to the survival of the species as outlined in the conservation advice. In the broader landscape it is considered more likely the species will utilise more favourable vegetation in the west further from potential disturbance.

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

The occurrence record of Yellow-bellied Glider within the last 20 years has a concentration of records north of the proposed impact site (refer **Plan A19**). These records currently exist beyond existing residential development reducing the potential connectivity to the site. Some records were noted within existing large vegetation patches to the north in Greenbank Military Training area and to the west and towards Spring Mountain - as White Rock Conservation Park which contain a higher proportion of mature remnant eucalypts. The WildNet search results yielded two records of this species within a 5 km radius of the site.

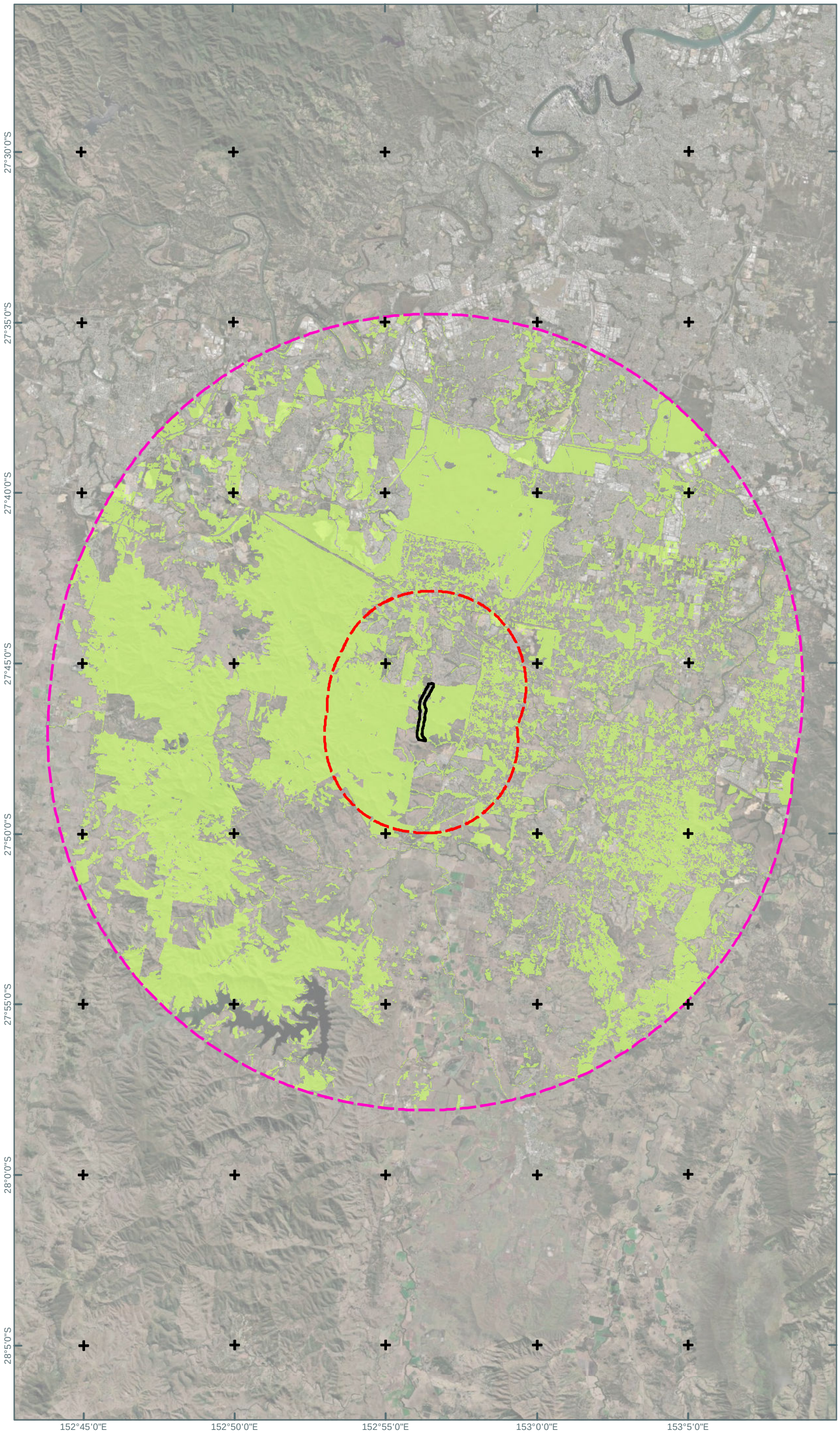
During field survey efforts no evidence of the species was observed.

It is expected there is a low probability that this species would occur on-site due to all records being located offsite over the past 20 years.

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

Considering the patchy distribution of habitat available within the impact area, disturbance throughout and adjacent to the site and higher quality vegetation located within the broader landscape, it is considered unlikely that the Yellow-Bellied Glider will occur on the site.

A18. YELLOW-BELLIED GLIDER POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Yellow-bellied Glider habitat within 20km of referral area [39%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

1:210,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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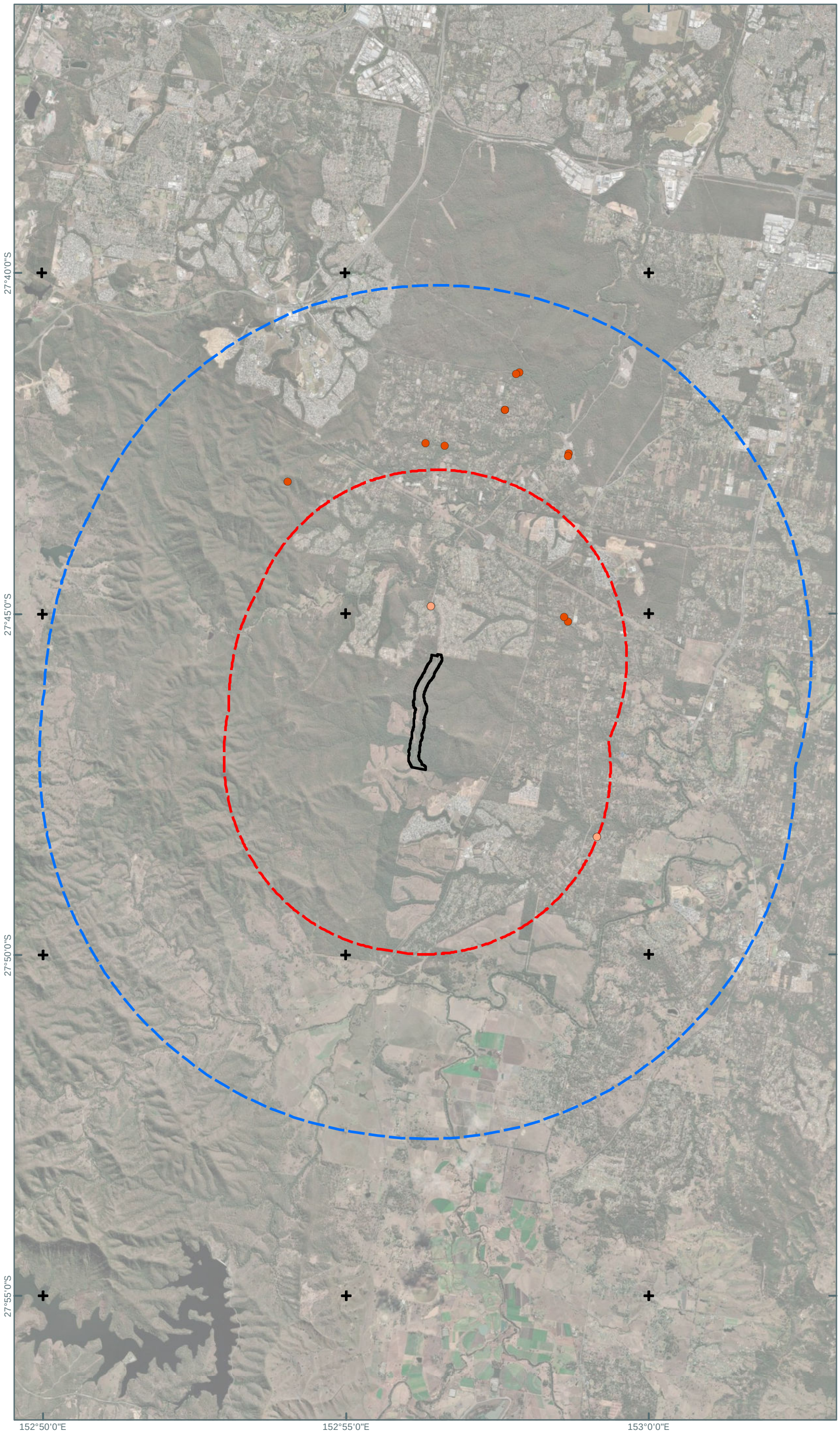
8418 E A18 NBR YBG Habitat A

A19. YELLOW-BELLIED GLIDER OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Yellow-bellied Glider records within 10km of referral area recorded within past 20 years [13]
- Yellow-bellied Glider (Southern) records within 10km of referral area recorded within past 20 years [2]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A19 NBR YBG Records A

3.3.9. Spotted-tailed Quoll (Dasyurus maculatus maculatus)

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

Distribution

The Spotted-tailed Quoll (southeastern mainland population)) occurs in eastern Australia from south-eastern Queensland to western Victoria.

Ecology

The Spotted-tailed Quoll is carnivorous, feeding on a wide variety of prey such as small-medium sized mammals, birds, reptiles, fish, amphibians, and invertebrates. They are solitary animals that occur at low densities. Males have larger ranges of up to a few thousand hectares in size, while females have smaller ranges of several hundred hectares. Home range sizes may vary depending on the quality of habitat – ranges may be smaller in the higher quality habitat in northern New South Wales than in southern New South Wales and Victoria.

Habitat

The Spotted-tailed Quoll is a mainly forest dependent species but occurs in a variety of habitats including closed forests (including temperate and sub-tropical rainforest), tall eucalypt forests, open woodlands, open forests, drier rainshadow woodlands and coastal heathlands. The highest densities of the species have been recorded from both wet and dry forest habitats. During the day Spotted-tailed Quolls shelter in fallen logs, boulder piles, burrows, tree hollows and occasionally under dwellings.

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

As a result of historic modification and current road uses, the impact area is a comprised of a combination of remnant, regrowth and non-remnant vegetation. Preferable habitat is predominately located within the mapped remnant vegetation areas. Habitat in the northern extent is limited by mapped non-remnant vegetation. The mapped remnant areas are located in the southern-western area provide some habitat value. A significant portion of the remnant vegetation within the impact area is adjacent to cleared paddock areas in the west limiting connectivity. A cleared area is also located throughout the centre of the impact site characterised by the existing New Bieth Road which is utilised for 4WD and motorbike use in addition to dumping of rubbish.

Within the broader landscape more contiguous preferrable habitat occurs to the west of site in association with existing conservation areas White Rock Spring Mountain Forest Park and Stewardale Nature reserve with some connectivity through the impact site along Flagstone creek (refer **Plan A20**). Fauna movement solutions are proposed to be implemented in association with the creek in the lower portion of the site.

Some connectivity between areas of potential habitat occurs in the east with a polygon of remnant vegetation. However, as part of the Flagstone PDA, this area is earmarked for future development and is bordered by residential areas and high traffic roads.

Given the high levels of disturbance, patchy distribution of preferred habitat and more contiguous vegetation areas located in the west of the site, the value of the habitat on site for Spotted-tailed Quoll is considered to be limited, particularly within the proposed impact area.

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

As discussed, the proposed impact area contains a mix of habitat values with the existence of large hollow bearing trees and assorted debris alongside the existing road reserve and cleared areas. Remnant, regrowth and non-remnant habitat values occur across the site with highly modified areas as a result of historical clearing, ongoing disturbances and road uses. The vegetation on site consists of a variety of vegetation communities with different levels of maturity and disturbance.

The north-west areas of site and regrowth vegetation include areas of the existing cleared road reserve and highly disturbed areas which are not considered valuable habitat for the species in its current state or in the future. The most preferred habitat will be located within the remnant portions of vegetation located towards the south-eastern portion of the impact site. This vegetation offers some connectivity to a vegetation patch in the east, however as part of the Flagstone PDA is earmarked for future development.

Within the broader landscape areas to the west within White Rock – Spring Mountain Conservation Park and Stewartdale Nature Refuge offer a greater area of connected remnant vegetation (**Plan A20**). These larger areas compared to the narrow impact site are also likely to contain a greater proportion of large trees and debris for shelter in addition to diverse less disturbed regional ecosystems. Potential habitat within the impact area is of marginal value and as a linear stretch of historically modified vegetation holds limited potential foraging area in comparison to nearby vegetation.

Due to the factors outlined above, the vegetation on-site is not considered likely to provide critical habitat for the species as outlined in the conservation advice.

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

A search of the Atlas of Living Australia returned no records for the species within 5 km of the impact site and buffer area (refer **Plan A21**). Further expanding the search to a 10 km radius, 12 records were observed with the most recent occurring northeast of the impact site in 2011. Historically the species records have been focussed primarily towards the north. However, they exist beyond existing residential development limiting potential connectivity with the impact site.

Surveys conducted throughout the impact site, in adjoining land and within the broader Logan City Council area revealed no evidence of Spotted-tailed Quoll. As a result, it is expected there is a low probability that this species would occur on-site.

Notably, the Wildlife Preservation Society of Queensland (Quoll Seeker's Network) in association with Logan City Council placed a number of wildlife cameras across Logan City Council over a 3-year program. Motion

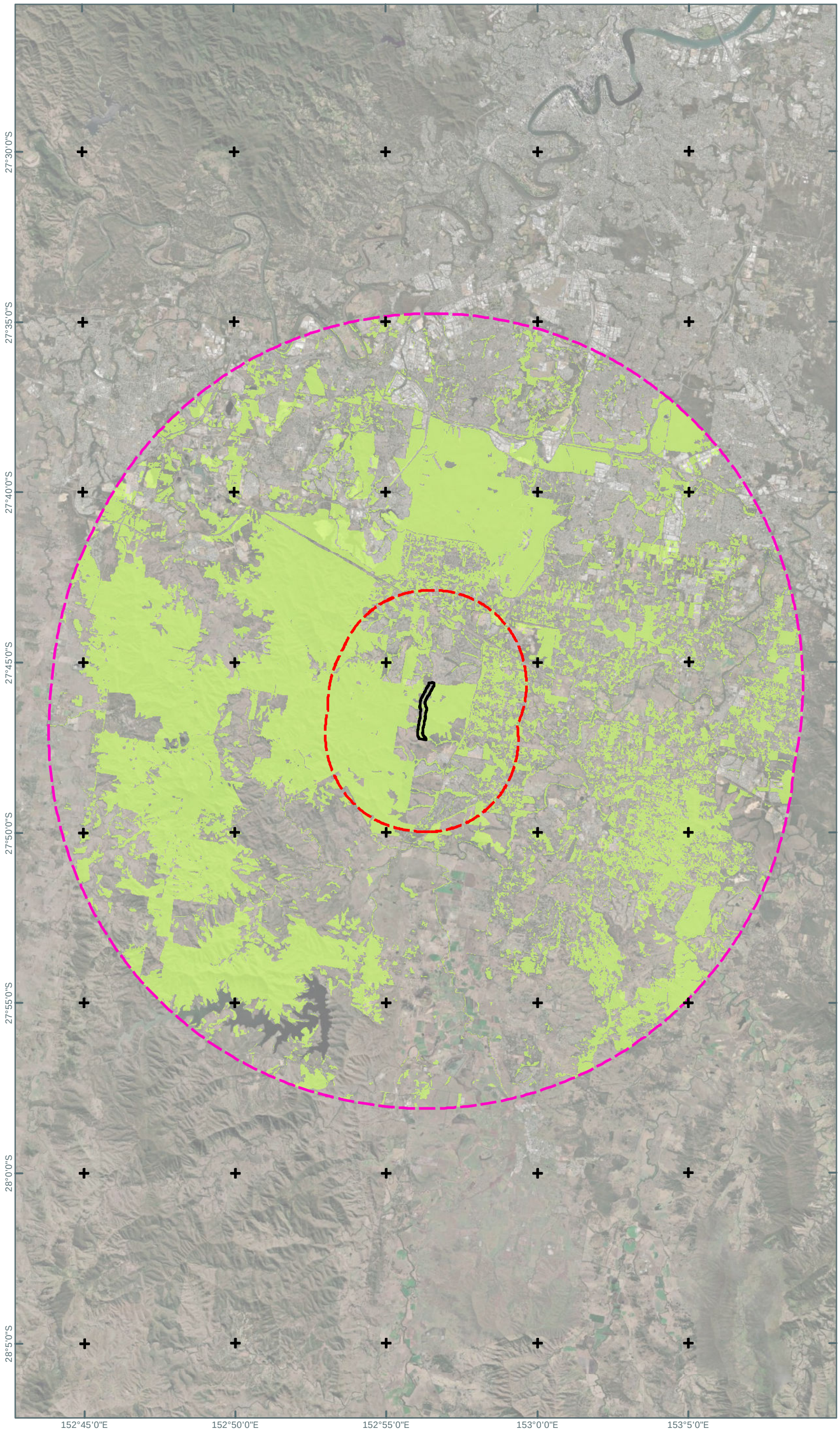
sensor cameras were located on private properties, Council Reserves, National Parks, Energex owned land and the Greenbank military airbase between 2011 and 2014. Cameras were placed at 107 sites at 47 locations across Logan City Council. They were placed in areas of reported sightings, or where detector dogs had indicated but direct searches were unable to substantiate evidence (e.g. scats.) The 3-year program took over 205,000 pictures but did not photograph a single image of a Quoll. It is noted that a Quoll scat was recently recorded and confirmed near Flinders Peak, south of the referral area.

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

In reference to item 3.3.8 (d) no Spotted-Tailed Quoll individuals were observed during any of the field surveys conducted. The WildNet search results show no records of this species within a 5 km radius of the site. Past observations of the species have been located north-east of the subject site.

Considering the patchy distribution of habitat available within the impact area, considerable disturbance throughout the site and greater quality of vegetation located within the broader landscape, it is considered unlikely that the Spotted-tailed Quoll will occur on the site.

A20. SPOTTED-TAILED QUOLL POTENTIAL HABITAT



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Known and potential Spotted-tailed Quoll habitat within 20km of referral area [39%]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 2 4 6 8 10 km

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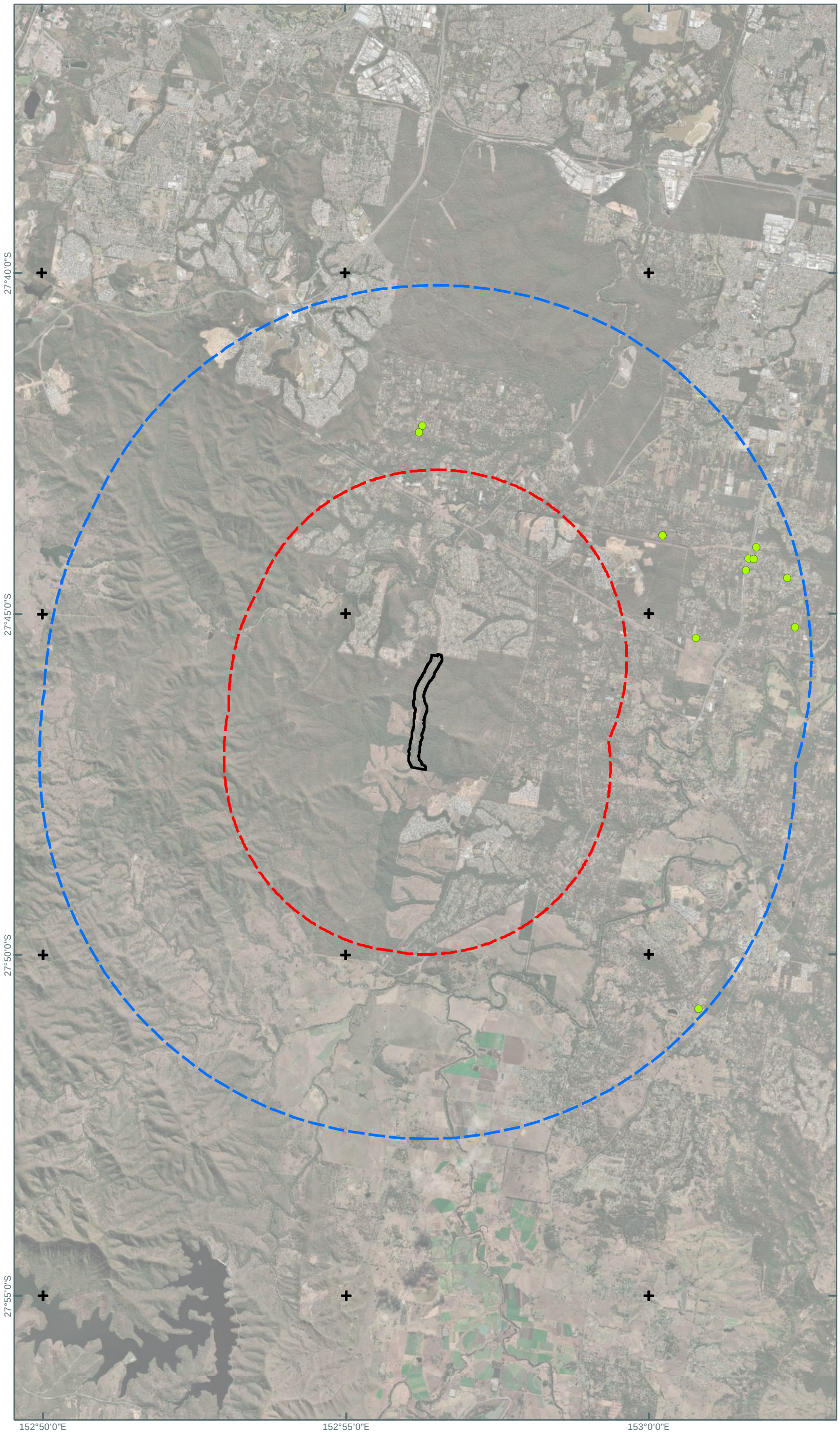
8418 E A20 NBR STQ Habitat A

A21. SPOTTED-TAILED QUOLL OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Spotted-tailed Quoll records within 10km of referral area recorded within past 20 years [12]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A21 NBR STQ Records A

3.3.10. White-throated Needletail

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

Distribution

The White-throated Needletail is widespread in eastern and south-eastern Australia. In Queensland it is recorded in all coastal regions, extending inland towards the Great Dividing Range and occasionally onto the adjacent plains.

Habitat and Ecology

The White-throated Needletail is almost exclusively aerial, from heights of less than 1m to more than 1000m above the ground. They are recorded more often over wooded areas, including open forest and rainforest. They may also fly between trees in clearings, below the canopy and less commonly recorded flying above woodland.

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

White-throated Needletails are almost exclusively aerial and are known to occur over a variety of habitats, including over urban areas. Due to the species range of potential fly-over vegetation types it often is triggered in protected matter searches.

Historically the species has been predominantly observed within the more northern areas of the broader landscape amongst projected contiguous vegetated areas, rural residential properties and amongst urban landscapes. Potential habitat exists onsite in the form of hollow bearing trees however they are limited in comparison to the habitat values located in more connected vegetation to the west and north. Breeding habitat in the form of hills and mountains are absent, with the nearby conservation estates are likely to provide an environment of significantly higher value to that on-site.

Potential habitat within the impact area is of marginal value and as a linear stretch of historically modified vegetation holds little potential foraging area in comparison to nearby vegetation. Furthermore it was not detected on-site or as a fly-over species during field work.

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

Vegetation values within the impact site and buffer area are dominated by historically modified area and assorted patches of remnant vegetation. The site area reflects a narrow linear strip of vegetation located adjacent to many non-remnant mapped areas to the west. As previously mentioned, White-throated Needletails are almost exclusively aerial, occurring over a variety of habitats.

This species forages aerially, at a wide range of heights over a variety of habitats, including heavily forested vegetation to open areas, including farmlands. The species has been previously recorded roosting in trees, both within dense foliage and hollows, however, the references to the species roosting is possibly over-emphasised (Higgins 1999).

It is considered the vegetated areas along the impact site and within the buffer would provide opportunistic foraging habitat for the species, regardless of the condition, though considered unlikely. Higher quality habitat is located in the west and north where larger more diverse mature eucalypt forests are located with a higher density of hollow bearing trees.

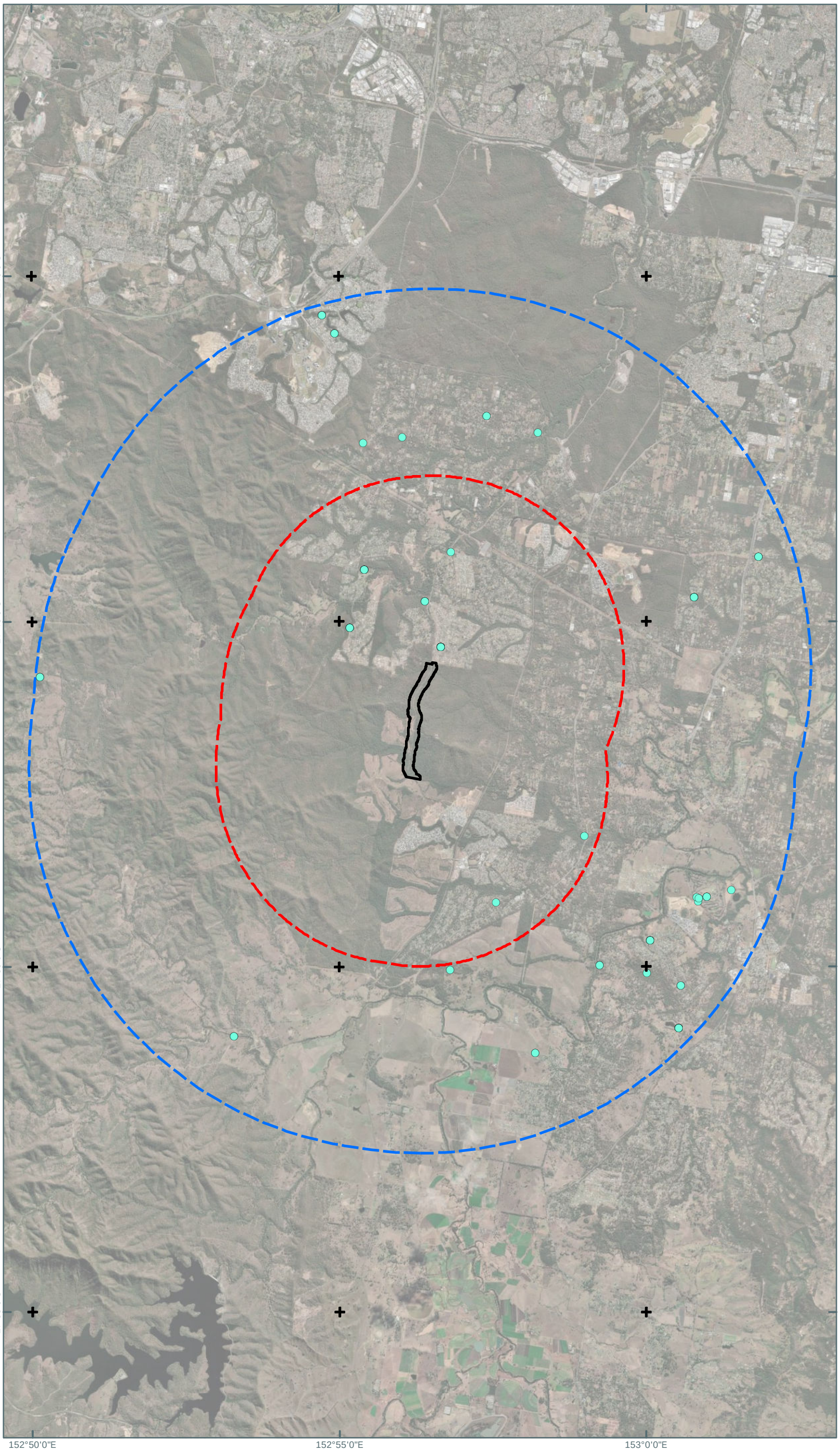
d. Information detailing known populations or records within at least five kilometres of the development footprint and (if known) the size of these populations.

A search of the White-throated Needle tail records returned a scattered array of records across the broader landscape from the north to south-east. This is consistent with the aerial behaviour of the species and large ranges. Within 5k of the site records are confined to only 7 locations within the last 20 years existing amongst current residential properties (refer **Plan A22**). WildNet Online records 1 sighting within a 5 km radius of the site.

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

Given the more abundant habitat values located offsite and the disturbance currently existing on and adjacent to the site it is considered unlikely the species would preferentially utilise the site. Furthermore, records of the species within the context of the site are mostly scattered around the broader landscape which suggests the species are more likely to be observed as a fly-over or opportunistic forager, rather than roosting or breeding behaviour. No evidence of the species occurring onsite were noted throughout the extensive field surveys suggesting the White-Throated Needletail is not utilising the site. As such, it is considered unlikely that the species will occur on site, especially considering the relatively narrow area and buffer.

A22. WHITE-THROATED NEEDLETAIL OCCURRENCE RECORDS



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LEGEND

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- White-throated Needletail records within 10km of referral area recorded within past 20 years [106]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 1 2 3 4 5 km

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8418 E A22 NBR WTN Records A

3.4.Baseline and Field Surveys

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

f. Information on the survey methodology or technique used (e.g., thermal image detection, dog detection, eDNA methods, camera trapping, tree hollow search, SAT surveys etc)

g. When surveys were conducted (e.g., dates, time of day, season, etc.) and survey effort (e.g., two hours for every one hectare within a 5-hectare area)

h. Map/s of survey points or transects and how the survey points or transects were selected.

i. An assessment of the adequacy of any surveys undertaken with reference to any relevant scientific literature and/or statutory documents. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. Please note: If you are unable to provide details of survey in accordance with relevant survey guidelines (approved by the Australian Government) the department considers the species are present within the proposed action area.

j. Results of all surveys undertaken.

3.4.1. Desktop Analysis

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

- Commonwealth MNES protected under the EPBC Act on and around the referral area using the protected matters search tool with a 5 km radius (refer **Appendix A7**);
- *Nature Conservation Act 1992* (NCA) listed threatened species on and around the referral area using the wildlife online database search tool with a 5 km radius (refer **Appendix A8**);
- Public environmental databases including Atlas of Living Australia and BioMaps;
- State regulated vegetation management and vegetation supporting maps under the VMA including essential habitat mapping; and
- Local government records where MNES threatened species and communities are known to occur in the area.

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

3.4.2. Field Survey Methodology

Field surveys utilising the methods outlined in the following subsections and **Part B Referral MNES Report Section 4.2** were conducted to describe ecological value of the referral area (refer **Plan A23** for summary of contemporary field surveys and Part B MNES Report). Field surveys were undertaken during seasonal conditions generally favourable to the detection and identification of flora and fauna species. Field survey methods were determined based on target species and communities and EPBC Act listed species guidelines.

Initial field surveys for EPBC referral were completed during November 2022 and December 2022 (**Part B MNES Report**). These surveys involved the following:

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

Contemporary targeted MNES flora and fauna surveys were undertaken on 12 – 15 February and 1 – 5 March 2024, during relatively warm conditions with minimal recent rainfall within the locality (<20 mm rainfall recorded, BOM 2024) (refer **Table A8**).

Table A8: Contemporary Field Survey Methods Summary

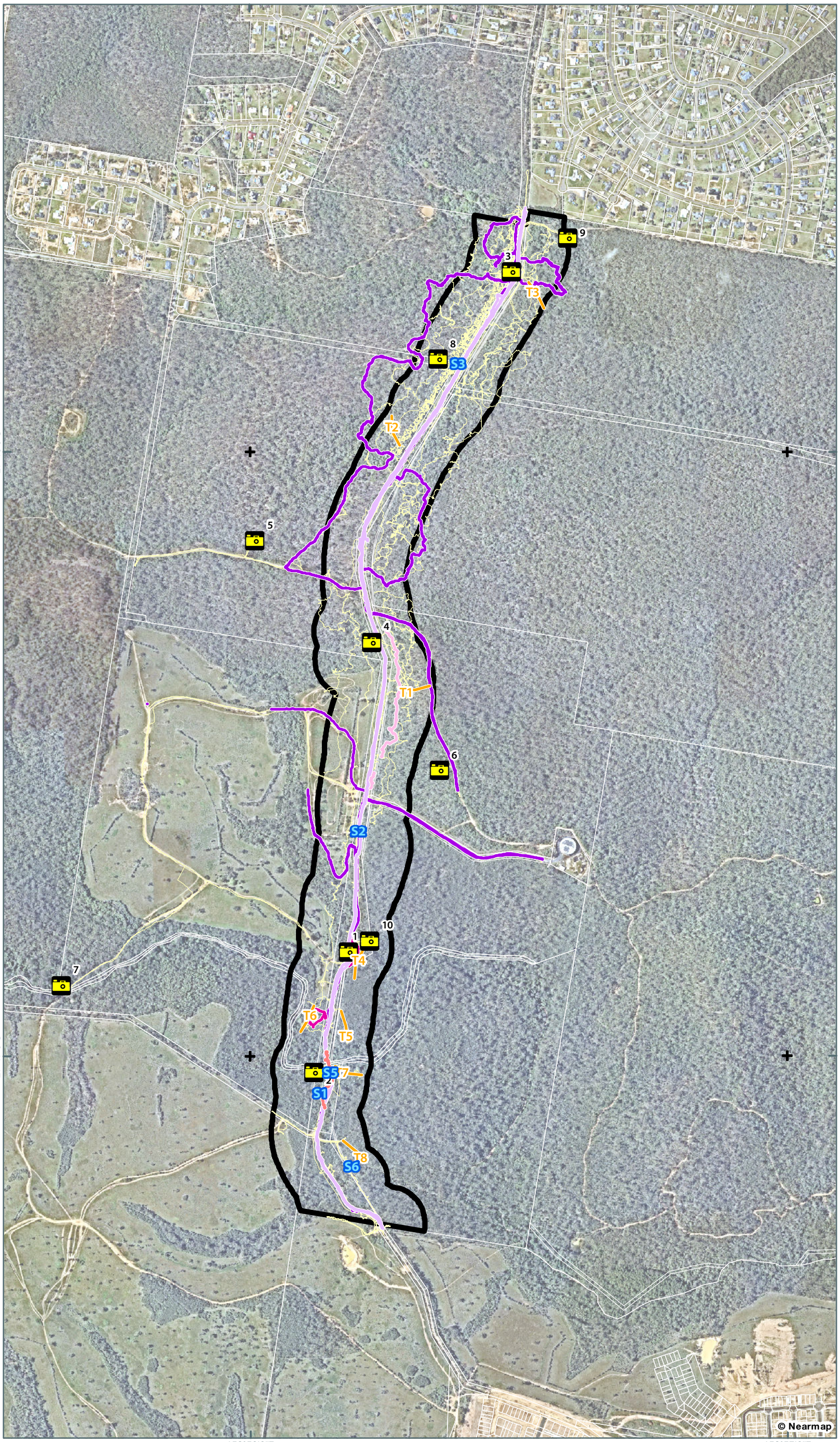
Date	Weather Conditions	Time	Methods
12 February 2024	19.2°C min – 29.0°C max 0 mm rainfall recorded	9:00 am – 3:00 pm	Deployed motion sensing cameras x 6
13 February 2024	18.7°C min – 30.2°C max 3.0 mm rainfall recorded	1:00 pm – 9:30 pm	Diurnal large tree and hollow identification, fauna habitat assessment and spotlighting for nocturnal animals.
14 February 2024	18.2°C min – 33.5°C max 0 mm rainfall recorded	8:00 am – 2:00 pm	Diurnal large tree and hollow identification and fauna habitat assessment.
15 February 2024	22.6°C min – 30.5°C max 0 mm rainfall recorded	1:00pm – 9:20 pm	Diurnal large tree and hollow identification, fauna habitat assessment and spotlighting for nocturnal animals.
26 February 2024	20.0°C min – 34.3°C max 1 mm rainfall recorded	8:00 am – 2:00pm	Fauna habitat assessment, MHQA transects and SAT surveys.
1 March 2024	19.4°C min – 33.4°C max 0 mm rainfall recorded	7:45 am – 3:00 pm	MHQA transects, SAT surveys, and camera collection.
4 March 2024	22.8°C min – 32.3°C max 0 mm rainfall recorded	8:00 am – 3:00 pm	MHQA transects and SAT surveys.
5 March 2024	20.9°C min – 27.0°C max 15 mm rainfall recorded	8:00 am – 3:30 pm	MHQA transects and SAT surveys.

Source: Bureau of Meteorology – Jingle Downs (040786) weather station for rainfall and Greenbank Defence (140009) weather station for temperature data.

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

- *Survey guidelines for Australia's threatened bats.*
- *Terrestrial Vertebrate Fauna Survey Guidelines.*
- *Survey Guidelines for Australia's Threatened Mammals.*
- *EPBC Act referral guidelines for the endangered Koala.*

A23. FIELD SURVEY EFFORT



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

Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/
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LEGEND

- Qld DCDB
- Referral Area
- Camera Trap Locations
- SAT Survey Locations
- Habitat quality transects
- SAT Meander
- Scat Meander (2022)
- Scat Meander (2024)
- Spotlighting (2022)
- Spotlighting (2024)
- GPS Track Log

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:12,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

10/07/2025

8418 E A23 NBR Field Survey A

3.4.3. Observational survey for significant flora and fauna, habitat trees and biodiversity values

The referral area, and surrounding vegetation, has been traversed during each of the surveys outlined within **Table A8** 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 referral area, including faunal lists and significance status of species under the Commonwealth's EPBC Act including the JAMBA, CAMBA, ROKAMBA and the Bonn Convention, and Queensland's NCA. Refer to **Appendix A9** for full flora and fauna list.

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.

For the purposes of this report, a significant flora and fauna species has been defined as a species that is scheduled as 'critically endangered', 'endangered', 'vulnerable' or conservation dependent under the Commonwealth EPBC Act.

3.4.4. Ground-truthing of vegetation communities

Vegetation has been ground-truthed and assessed against *Vegetation Management Act 1999* (VMA) Regional Ecosystem (RE) mapping and pre-clear mapping. Survey methodology comprised of an initial visual audit, followed by quantitative assessment of vegetation associations and communities.

The initial visual audit consisted of a random meander over the site to ground-truth desktop investigations and identify the location and extent of any vegetation associations and communities. Qualitative assessments were undertaken by collecting data associated with structural formations (i.e. growths form, stratum intervals, crown cover and height) and floristic associations (i.e. species diversity) for each broad vegetation type. Results of vegetation community assessment is presented in **Section 3.4.12**.

3.4.5. Scats, tracks and other traces observations

Opportunistic observations of scats, tracks and other fauna traces were conducted throughout each survey period. Both predator and non-predator scats were sought during all searches. Specific search efforts were made to locate the presence of Koalas or evidence of their occurrence on the subject lands and the local area. In addition, particular attention was paid to the identification of potential dens, scats and tracks for invasive species, such as European Red Fox, domestic cats, and wild dogs to identify predator-prey interactions and understand existing impacts within the referral area.

3.4.6. Spot Assessment Technique (SAT)

Tools for determining localised levels of use by *Phascolarctos cinereus* (Koala) included the Spot Assessment Technique (SAT), scat meanders, as well as direct observations for Koala and Koala activity throughout the field survey period. These surveys were completed in February and March 2024. Additional general observations and habitat features across the site were also recorded. SAT surveys were undertaken on-site in

accordance with the methodology developed by the AKF[4] and specified in the EPBC Act Referral Guidance for the Endangered Koala (specifically, the *Survey Guidelines for Australia's Threatened Mammals* was incorporated where relevant).

The SAT method is an assessment of Koala activity involving a search for any Koalas and / or signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats or is known to be a food tree or otherwise important for Koalas, and recording any evidence of Koala usage of that tree including presence, identifiable scratches or scats. The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed. Assessment of each tree involves a systematic search for Koala scats beneath the tree within one metre radius of the trunk. After approximately two minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala. The number of trees showing evidence of Koala activity is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage[4].

Eight (8) SAT surveys were conducted across the site in 2024, and three (3) in 2023 (**Part B MNES Report**) with all returning a 'low or no use' for the Koala (*i.e.*, between 0.00% and 10% of the trees surveyed had Koala scats) in accordance with the East Coast (med-high) benchmark described by Phillips and Callaghan (2011). Where there were not a sufficient number of trees to meet the requirement of 30 trees surveyed, a scat meander was conducted. A scat meander involves two observers walking between trees and scratching around the base of the tree searching for identifiable scats. Where a scat is found, a full SAT survey is completed. Results of SAT are summarised in **Section 3.4.13** and **Table 12**. Raw Habitat Transects Sheets are provided in **Appendix A10**.

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

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

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

Categories are assigned as follows:

- Sites considered to be suitable or have high suitability for Koalas are assigned the East Coastal (med-high) category;
- Sites considered to have low suitability are assigned the East Coastal (low) category; and

[4] Phillips, S & Callaghan, J 2011, "The *Spot Assessment Technique*: a tools for determining localised levels of habitat use by Koala *Phascolarctos cinereus*", *Australian Zoologist*, 35:3.

- The Western category does not apply to South East Queensland Local Government Areas.

3.4.6. Motion sensor camera trap

Contemporary infrared fauna camera trapping was applied at the referral area 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 during 2024 field surveys across the subject site for a total of 18 days (**Plan A23**, refer also **Part B MNES Report** for pre-referral surveys). Cameras were attached 30-100 cm from the ground on a tree or post and directed towards landscape features. The cameras were baited with peanut butter and oat balls to target evidence of MNES fauna and threats to MNES including wild dogs in the broader area.

For inventory surveys, cameras were placed in the vicinity of an assumed animal trail within both non-remnant and remnant areas that were 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. Results from camera trap surveys are presented in **Section 3.4.14**.

3.4.7. Spotlight Surveys

A combination of high-powered spotlights and head torches were used to detect nocturnal mammals, birds, reptiles with an emphasis on detecting threatened species across the impact area. This technique involved detecting eye shine, and a record of vegetation density was taken. Spotlighting effort was targeted around waterways, MNES habitat and locations where significant habitat features were present, including hollows.

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

A total of four (4) spotlighting transects with consideration to the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (2018)* were completed by SHG across 13 and 15 February 2024, totalling a survey effort of 5 hours (**Plan A23**, refer also Part B MNES Report for referral spotlight surveys). Results from spotlighting surveys are presented in **Section 3.4.15**.

3.4.8. GPS Habitat Tree Plot

To gauge the potential suitability of vegetation on-site for Gliders and Glossy Black-cockatoo, a tree plot survey was conducted for trees > 460 mm and trees containing hollows across the proposed impact area and buffer to retained vegetation. The purpose of this assessment was to quantify the presence of large / hollow-bearing trees across the site as these are critical habitat features of both the Greater Glider and potentially the

Yellow-bellied Glider and Glossy Black-cockatoo as essentially shelter and denning resources, and also to map suitable foraging habitat for the Glossy Black-cockatoo (*Allocasuarina* and *Casuarina* spp.) A handheld DGPS device (Trimble) was used 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); (All trees = or > 450mm)
- height of the tree measured using a laser rangefinder with three-point measurement capability (e.g. inclinometer);
- canopy spread estimated from trunk base;
- health assessment (e.g. canopy thinning, trunk damage); and
- habitat values (e.g. presence and/or number and size of hollows observed in trunk and branches, nests, termites, scratches and scats).

The Tree Protection Zone (TPZ) of the tree was calculated using the formula outlined in *Australian Standard AS4970-2009 – Protection of Trees on Development Sites* (TPZ = DBH x 12). A TPZ must not be less than 2 metres (m) and no greater than 15 m (except where crown protection is required). Additionally, the Structural Root Zone (SRZ) was calculated for each plotted specimen using the measured DBH and the following formula:

$$\text{SRZ radius} = (\text{DBH} \times 50)^{0.42} \times 0.64.$$

Results of this tree-plot survey are presented in **Section 3.4.16**.

3.4.9. Modified Habitat Quality Assessment

The proposed action was divided into five (5) Assessment Units (AUs) to reflect the differing states and characteristics of the vegetation across the site (refer **Plan A4** and **Table A10**). The MHQA methodology was utilised during site surveys undertaken on 26 February and 1, 4 and 5 March 2024 that included eight (8) modified habitat quality assessment transects and eight (8) SAT surveys and meanders (**Plan A23**). Data from these contemporary surveys was then used to assess the referral area condition, site context and species stocking rate in the context of the MHQA. The vegetation within the referral area is mostly consistent with the mapped Regional Ecosystem although some disturbance throughout the vegetation from weed incursion is present. The assessment units are shown in **Plan A4.** Raw MHQA transect data are presented in **Appendix A10**.

Table A10: Referral Area Assessment Units

Assessment Unit	VMA Category	Vegetation Status	Regional Ecosystem	Site Description	Area (ha)
AU1	Category X	Non-remnant	Pre-clear composite 12.9-10.19a/12.9-10.12/12.9-10.7a	Cleared with scattered regrowth. Vegetation on-site reflective of pre-clear RE12.9-10.19a.	31.5 ha
AU2	Category B	Remnant	Least Concern RE12.9-10.2	Highly disturbed with scattered mature trees, canopy dominated by *Corymbia citriodora* understorey dominated by *Acacia sp.*	44.1 ha
AU3	Category B	Remnant	Of Concern RE12.3.11 / 12.3.7	*Eucalyptus tereticornis* with *Melaleuca quinquenervia* and *Lophostemon suaveolens* adjacent to waterways. On-ground vegetation representative of RE12.3.11.	6.2 ha
AU4	Category B	Remnant	Of Concern RE12.9-10.7	*Eucalypt sp.* dominated woodland with mixed understorey.	4.2 ha
AU5	NA	NA	NA	Cleared existing track	4.4 ha

Two MHQA transects were applied per assessment unit with observation points utilised to ascertain assessment unit extent excluding the existing track (**Plan A23**). Notably, transects were located outside of the existing cleared road area so are considered more representative of adjoining vegetation values relative to the existing road. Therefore, habitat scores are likely to be conservative and more reflective of adjoining higher values.

In order to determine the quantum and quality of the habitat suitable for MNES within the referral area, vegetation/habitat quality was derived from the Modified Habitat Quality Assessment 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 Modified Habitat Quality Assessment (MHQA) methodology was utilised to assess the referral area condition, site context and species stocking rate. Refer to **Section 4.4.2** for more detail on methodology.

3.4.10. Vegetation Communities and Assessment Units

The following sections discuss the results of the contemporary field verification surveys of vegetation communities within the referral area. On-ground vegetation characteristics were utilised to delineate vegetation communities and assessment units. Initial field surveys (refer **Part B MNES Report**) identified six (6) vegetation communities within the referral area which were used to determine the four (4) assessment units (**Plan A4**). Refer to **Appendix A9** for full flora and fauna list.

The site is mapped as containing Category X (non-remnant) vegetation in the northern extent of the road reserve. In this area, the eastern side is confirmed to be mostly cleared underneath a powerline easement

adjacent to the existing track. Pre-clear mapping indicates this non-remnant area consists of a composite RE 12.9-10.19a/12.9-10.12/12.9-10.7a. Field surveys indicate the vegetation is representative of RE12.9-10.19a. The southern extent of the road consists of Category B remnant vegetation with a mix of Regional Ecosystems (RE) validated on-ground. The regional ecosystems that were ground truthed to be present on site are the Least Concern RE 12.9-10.2, composite Of Concern RE 12.3.11/12.3.7, and Of Concern RE 12.9-10.7. These RE's are described in **Table A11** below.

Three more substantial waterways traverse the road reserve, one in the north associated with Abrade Creek, a second in the south associated with Flagstone Creek and slightly to the north of this, a tributary of Flagstone Creek. It is noted a small portion of Category C (high-value regrowth) vegetation is mapped through the centre of the road reserve, described as composite Endangered RE 12.9-10.19a/12.9-10.12/12.9-10.7a. Vegetation across the referral area where present in the eucalypt dominated areas is generally consistent with RE mapping, consisting of a variety of canopy tree species including *Eucalyptus tereticornis* (Forest Red Gum), *Angophora leiocarpa* (Smooth-barked Apple), *Corymbia citriodora* (Spotted Gum) and *Corymbia intermedia* (Pink Bloodwood). A summary of the preclear mapped Regional Ecosystems is provided in **Table A11**.

Table A11: Regional Ecosystem Descriptions

Regional Ecosystem	VMA Status	Short Description
Non-remnant	None	Non-remnant vegetation
12.9-10.7	Of Concern	*Eucalyptus crebra* +/- *E. tereticornis*, *Corymbia tessellaris*, *Angophora leiocarpa*, *E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c). 12.9-10.7a: *Eucalyptus siderophloia*, *Corymbia intermedia* +/- *E. tereticornis* and *Lophostemon confertus* open forest. Occurs on Cainozoic and Mesozoic sediments in near coastal areas. Not a Wetland (BVG1M: 12a).
12.9-10.2	Least Concern	*Corymbia citriodora subsp. variegata* open forest or woodland usually with *Eucalyptus crebra*. Other species such as *Eucalyptus tereticornis*, *E. moluccana*, *E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b)
12.3.11	Of Concern	*Eucalyptus tereticornis* +/- *E. siderophloia* and *Corymbia intermedia* open forest to woodland. *Corymbia tessellaris*, *Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include *Angophora leiocarpa*, *E. exserta*, *E. grandis*, *E. latisinensis*, *E. tindaliae*, *E. ariegate* and *Melaleuca sieberi*. *Corymbia trachyphloia* and/or *C. citriodora subsp. ariegate* may dominate on areas of Pleistocene alluvia. *Eucalyptus seeana* may be present south of Landsborough and *Livistona decora* may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)

Regional Ecosystem	VMA Status	Short Description
12.3.7	Of Concern	Narrow fringing woodland of *Eucalyptus tereticornis*, *Casuarina cunninghamiana subsp. cunninghamiana* +/- *Melaleuca viminalis*. Other species associated with this RE include *Melaleuca ariegate*, *M. trichostachya*, *M. linariifolia*. North of Brisbane *Waterhousea floribunda* commonly occurs and may at times dominate this RE. *Melaleuca fluviatilis* occurs in this RE in the north of the bioregion. *Lomandra hystrix* often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region. (BVG1M: 16a)
12.9-10.19	Least Concern	*Eucalyptus fibrosa subsp. fibrosa* woodland +/- *Corymbia citriodora subsp. ariegate*, *E. acmenoides* or *E. portuensis*, *Angophora leiocarpa*, *E. major*. Understorey often sparse. Localised occurrences of *Eucalyptus sideroxylon*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 12a). 12.9-10.19a: *Corymbia henryi* and/or *Eucalyptus fibrosa subsp. fibrosa* open forest. Other commonly associated species include, *Corymbia citriodora subsp. ariegate*, *E. carnea*, *E. siderophloia*, *E. crebra* and *E. major*. Occurs in coastal areas on Cainozoic and Mesozoic sediments. Not a Wetland (BVG1M: 10b).
12.9-10.12	Endangered	RE12.9-10.12: Mixed woodland to open forest usually containing *Corymbia intermedia*, *Angophora leiocarpa* and at least a presence of *Eucalyptus seeana*. Other commonly associated species include *E. siderophloia*, *E. tereticornis*, *E. ariegate subsp. ariegate* and *C. citriodora subsp. ariegate*. *E. seeana* and *Lophostemon suaveolens* are often present as sub-canopy or understorey trees. Occasional *Melaleuca quinquenervia* on lower slopes. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g)

Assessment Unit 1: Non-remnant (RE12.9-10.19a/12.9-10.12/12.9-10.7a)

Assessment Unit (AU) 1 is located at the northern extent of New Beith Road within an area mapped as non-remnant vegetation. Pre-clear mapping contains the composite RE 12.9-10.19a/12.9-10.12/12.9-10.7a. On-ground vegetation consists of Eucalypt dominated communities reflective of RE12.9-10.19a with indicator species including *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark), along with *Corymbia tesselaris* (Moreton Bay Ash) and *Eucalyptus tereticornis* (Forest Red Gum) (**Photo 1**). The sub-canopy layer is dominated by *Acacia disparrima* (Hickory Wattle) and *Allocasuarina littoralis* (Black She-oak). The vegetation is characterised by a high level of disturbance from weed incursion, vehicle use and invasive species. The ground and shrub layers are dominated by invasive species including *Megathyrsus maximus* (Guinea Grass), *Lantana camara* (Lantana), *Paspalum dilatatum* (Paspalum) and *Ageratum houstonianum* (Blue Billygoat Weed) (**Photo 2**). Some native species are scattered throughout the ground layer including *Cymbopogon refractus* (Barbed Wire Grass), *Imperata cylindrica* (Bladey Grass), *Gahnia aspera* (Saw Sedge) and *Lomandra longifolia* (Many-flowered Mat Rush). Large and hollow-bearing trees are limited to the edges of the road throughout AU1, with adjoining vegetation containing evidence of regrowth and logging (**Photo 3**).

Photo 1: AU1 – Non-remnant RE12.9-10.19a with *Corymbia citriodora* and *Eucalyptus crebra*.

Photo 2: AU1 – Cleared and regrowth areas with high level of weed incursion and disturbance.

Photo 3: AU1 – Scattered large trees along road edge.

Assessment Unit 2: Remnant (RE12.9-10.2)

AU2 consists of two polygons, one area through the centre of the road reserve and a second at the southern end. The northern extent of AU2 contains highly modified vegetation. West of the road reserve contains cleared areas with some scattered large mature trees, where disturbance by dirt bikes and 4WD is frequent. Non-remnant vegetation borders the mapped remnant RE12.9-10.2 west of the road reserve (**Photo 4**). Through the central portion, eucalypt dominated vegetation is present with canopy species predominantly *Eucalyptus tereticornis* (Forest Red Gum), *Angophora leiocarpa* (Smooth-barked Apple), *Corymbia citriodora* (Spotted Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus propinqua* (Grey Gum) (**Photo 5**). The understorey is dominated by regrowth *Acacia sp.* and *Alphitonia excelsa* (Soap Tree) and the ground layer is absent of vegetation throughout the cleared track with invasive species dominating either side of the road.

The southern polygon of AU2 contains vegetation dominated by regrowth *Acacia sp.* and *Alphitonia excelsa* (Soap Tree) which demonstrates evidence of fire disturbance (**Photo 6**). Canopy species in this area are dominated by *Corymbia citriodora* (Spotted Gum) with *Angophora leiocarpa* (Smooth-barked Apple), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus tereticornis* (Forest Red Gum) which is indicative of RE 12.9-10.2. Limited native ground species are present throughout the southern extent of AU2, which are mainly restricted to the road edge and some mature hollow bearing trees are present within the road reserve.

Photo 4: AU2 – Non-remnant vegetation bordering AU2 vegetation.

Photo 5: AU2 – Remnant vegetation either side of road reserve.

Photo 6: AU2 – Southern extent of AU2 area.

AU3: Remnant (RE12.3.11)

AU3 contains two polygons that are associated with two tributaries of Flagstone Creek that traverse the road reserve. The northern polygon consists of a sub-canopy layer of *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) with a canopy of *Eucalyptus tereticornis* (Forest Red Gum) and scattered *Angophora leiocarpa* (Smooth-barked Apple) (**Photo 7**). Understorey shrubs throughout this area consist of *Acacia concurrens* (Black Wattle) and *Alphitonia excelsa* (Soap Tree). The waterway in the northern polygon does not contain defined bed and bank features, where there is some pooling water associated with the bund created by the road. There is no defined flow path upstream within the waterway. *Paspalum mandiocanum* (Broad-leaved Paspalum), *Chloris gayana* (Rhodes grass) and *Lantana camara* (Lantana) dominate the ground and shrub layer. Vegetation in this area is representative of mapped remnant RE12.3.11.

The southern portion of AU3, includes vegetation associated with the waterway that is dominated by canopy species *Eucalyptus tereticornis* (Forest Red Gum), *Grevillea robusta* (Silky Oak), *Lophostemon suaveolens* (Swamp Box), *Casuarina cunninghamiana* (River She-Oak) and *Melaleuca quinquenervia* (Broad-leaved Paperbark) (**Photo 8**). The median canopy height is 18 – 20 m with species indicative of RE 12.3.11 and 12.3.7 present in this area. The understorey and ground layers contains native species including *Lomandra longifolia* (Long-leaved Matrush), *Acacia fimbriata* (Brisbane Wattle), *Melaleuca viminalis* (Weeping Bottlebrush) and *Ottochloa gracillima* (Graceful grass). Dense infestations of weeds including *Verbena bonariensis* (Purple-top Verbena), *Lantana camara* (Lantana), *Chloris gayana* (Rhodes grass) and *Ageratum houstonianum* (Blue billy-goat weed) are present within the shrub and ground layers which indicates poor habitat for Koala.

Photo 7: AU3 – Vegetation associated with the northern waterway in AU3.

Photo 8: AU3 – Vegetation associated with the southern waterway in AU3.

AU4: Remnant (RE12.9-10.7)

AU4 vegetation consists of canopy species *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus tereticornis* (Forest Red Gum) with *Angophora leiocarpa* (Smooth-barked Apple) and *Corymbia citriodora* (Spotted Gum). Dense *Acacia sp.* and *Alphitonia excelsa* regrowth is present through the understorey with scattered canopy trees (**Photo 9**). Species present within this area are indicative of RE 12.9-10.7.

Photo 9: AU4 – Vegetation within AU4, with *Acacia sp.* regrowth dominated understorey.

AU5: Existing cleared track

AU5 is the existing cleared track that was not subject to detailed site assessment.

3.4.11. Targeted Fauna Survey Results

As outlined above in **Section 3.4.2**, targeted field surveys were conducted for MNES species that are likely or could potentially occur within the referral area. Spot Assessment Technique (SAT) surveys were applied to estimate Koala activity levels as described within **Section 3.4.2** following Philips & Callaghan (2011). Motion sensor camera traps were deployed in 2024 for a total of 18 days to target MNES species and potential threats to MNES. Spotlighting surveys were conducted to target nocturnal arboreal species including the Grey-headed Flying-fox, Greater Glider, Yellow-bellied Glider as well as the Koala and Spotted-tailed Quoll. Potential habitat assessment for Greater Glider, Yellow-bellied Glider and Glossy-black Cockatoo involved tree-plotting large trees and hollow-bearing trees within the referral area as well as potential foraging species for the latter.

A modified habitat quality assessment (MHQA) was used to assess the habitat quality for Koala, the methodology and results of which are described in **Section 4.4**.

Refer to **Sections 4.4** and **Section 4.5** for more detail on the assessment methodology used to quantify potential impacts on Koala and the SEFFW TEC, respectively.

A total of forty-three (43) fauna species were recorded across the site with forty (40) of these native species and three (3) of these considered introduced species. Overall, six (6) amphibians, twenty-seven (27) birds, nine (9) mammals and one (1) reptile were recorded (**Appendix A9**). The vast majority of fauna species recorded on-site are considered common to the local area. No listed threatened species under the EPBC Act or NCA were identified onsite.

It is noted, while not recorded in contemporary field surveys, feral mammal species, including *Canis lupus familiaris* (Dog) and *Sus scrofa* (Feral Pig) were also recorded on-site during initial field surveys (**Part B MNES Report**). Dogs are considered threats to the Koala and other native species. Further, the noxious amphibian *Rhinella marina* (Cane Toad) was very common on-site.

Koala Usage SAT Survey

Surveys for detecting the presence of Koala within the subject were undertaken during November and December 2022 as part of the EPBC referral and contemporary surveys conducted during February and March 2024 (**Plan A23** and **Part B MNES Report**). Tools for determining localised levels of use by *Phascolarctos cinereus* (Koala) included the Spot Assessment Technique (SAT), spotlighting, motion sensing cameras as well as direct observations for Koala and Koala activity throughout the field survey periods. An assessment for habitat suitability for Koala was also completed using the MHQA methodology. Targeted surveys for Koala were undertaken during the field surveys period from 13 – 15 and 26 February 2024, and 1, 4 and 5 March 2024. SAT surveys were undertaken on-site in accordance with the methodology developed by the AKF[5] and specified in the EPBC Act Referral Guidance for the Endangered Koala (specifically, the *Survey Guidelines for Australia's Threatened Mammals* was incorporated where relevant). Previous surveys were undertaken at the referral area during November and December 2022 which did not identify any evidence of the species.

In accordance with EPBC guidance material the Spot Assessment Technique (SAT) was applied in to search the site for the potential presence of the Koala. Three (3) SAT surveys were completed during the initial survey period in November and December 2022 (**Part B MNES Report)** and no evidence of Koala utilisation of the site was found. An additional eight (8) SAT surveys were conducted during contemporary field surveys in February and March 2024**. Table A12** provides a summary of Koala usage scores for the 8 contemporary SAT surveys completed and **Appendix A11** includes detailed SAT survey results

[5] Phillips, S & Callaghan, J 2011, "The *Spot Assessment Technique*: a tools for determining localised levels of habitat use by Koala *Phascolarctos cinereus*", *Australian Zoologist*, 35:3.

Table A12: Summary of SAT Results

SAT Site Number	SAT Score	Evidence of Koala Use (%)	Mean usage per AU	Koala Use (High/Medium/Low/No)
AU1				
S2 (@T2)	3/30	10%	5%	Low
S3 (@T3)	0/30	0%		
AU2				
S1 (@T1)	2/30	6.67%	3.335%	Low
S8 (@T8)	0/30	0%		
AU3				
S7 (@T7)	0/30	0%	0%	No
S4 (Meander @T4)	0/30			
AU4				
S5 (@T5)	0/30	0%	0%	No
S6 (Meander @T6)	0/30			

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 (high) Activity Category is appropriate for the site. Two (2) out of six SAT surveys identified Koala scats within the referral area. It is noted that search conditions for scats were hindered in some areas due to dense vegetation at the ground layer. The apparent low levels of Koala usage at the site may be a result of highly disturbed vegetation and modification from 4WD use, logging and fire.

Opportunistic and targeted spotlighting searches for Koalas were also undertaken as part of the field survey effort. No Koalas were observed on the site, however, the skeletal remains of two koalas (two koala skulls) were identified within vegetation onsite.

3.4.12. Motion Sensor Camera Trap Results

No MNES or conservation significant species were identified using the motion sensing camera traps deployed across the site. Fauna identified are considered to be common within the area. The motion sensor camera trap surveys detected eleven (11) unique fauna species (refer **Table A13**). The full fauna list from ecological surveys is provided in **Appendix A9**.

Table A13: Motion Sensing Camera Trap Fauna Detected

Scientific Name	Common Name	Taxa	Native / Introduced
Camera 1			
Phascogale tapoatafa tapoatafa	Brush-tailed phascogale	Mammal	Native

Scientific Name	Common Name	Taxa	Native / Introduced
Trichosurus vulpecula	Common Brushtail Possum	Mammal	Native
Alectura lathami	Australian Brush-turkey	Mammal	Native
Eopsaltria australis	Eastern Yellow Robin	Bird	Native
Varanus varius	Lace Monitor	Reptile	Native
Macropus rufogriseus	Red-necked Wallaby	Bird	Native
Camera 2			
Macropus rufogriseus	Red-necked Wallaby	Bird	Native
Camera 3			
Alectura lathami	Australian Brush-turkey	Mammal	Native
Rattus rattus	Black rat	Mammal	Introduced
Rattus fuscipes	Bush rat	Mammal	Native
Camera 4			
Macropus rufogriseus	Red-necked Wallaby	Bird	Native
Alectura lathami	Australian Brush-turkey	Mammal	Native
Rattus rattus	Black rat	Mammal	Introduced
Gymnorhina tibicen	Australian Magpie	Bird	Native
Wallabia bicolor	Swamp Wallaby	Mammal	Native
Trichosurus vulpecula	Common Brushtail Possum	Mammal	Native
Camera 5			
Eopsaltria australis	Eastern Yellow Robin	Bird	Native
Mus musculus	House mouse	Mammal	Introduced
Camera 6			
Alectura lathami	Australian Brush-turkey	Mammal	Native

3.4.13. Nocturnal Fauna Spotlighting Survey

Nocturnal spotlighting surveys did not detect any MNES or conservation significant species across the site over the two-night survey period. Fauna identified are considered to be common within the area. The nocturnal spotlighting surveys detected twelve (12) unique fauna species (refer **Table A14**). Full fauna list from ecological surveys is provided in **Appendix A9**. Raw field data from spotlighting surveys is provided in **Appendix A12**.

Table A14: Nocturnal Spotlighting Surveys Fauna Detected

Time Observed	Scientific Name	Common Name	Taxa	Native / Introduced
Spotlighting Night 1 (13/02/2024) – 7:00 pm – 9:30 pm, Cloud cover, no breeze, 25 ^{0} C.				
7:40 pm	*Trichosurus vulpecula*	Common Brushtail Possum	Mammal	Native
7:46 pm	*Ninox boobook*	Southern Boobook	Bird	Native
7:47 pm	*Litoria nasuta*	Striped Rocket Frog	Amphibian	Native
7:48 pm	*Dacelo novaeguineae*	Laughing Kookaburra	Bird	Native
7:50 pm	*Pseudophryne raveni*	Copper-backed Brood Frog	Amphibian	Native
7:58 pm	*Mixophyes fasciolatus*	Great Barred Frog	Amphibian	Native
8:28 pm	*Limnodynastes peronii*	Striped Marsh Frog	Amphibian	Native
9:23 pm	*Trichosurus vulpecula*	Common Brushtail Possum	Mammal	Native
Spotlighting Night 2 (15/02/2024) – 7:00 pm – 9:20 pm, Some cloud cover, no breeze.				
7:00 pm	*Mixophyes fasciolatus*	Great Barred Frog	Amphibian	Native
7:05 pm	*Podargus strigoides*	Tawny Frogmouth	Bird	Native
7:06 pm	N/A	Micro Bat sp.	Mammal	Native
7:06 pm	*Dacelo novaeguineae*	Laughing Kookaburra	Bird	Native
7:13 pm	*Pseudocheirus peregrinus*	Common Ringtail Possum	Mammal	Native
7:14 pm	*Rhinella marina*	Cane Toad	Amphibian	Introduced
7:14 pm	*Ninox boobook*	Southern Boobook	Bird	Native
7:40 pm	*Pseudophryne raveni*	Copper-backed Brood Frog	Amphibian	Native
7:46 pm	*Litoria latopalmata*	Broad-palmed Rocketfrog	Amphibian	Native

3.4.14. Habitat Tree Plot

Hollow-bearing trees were plotted within vegetation adjoining the existing track within a 100 m buffer either side of the New Beith Road extent (refer **Plan A24 – Hollow Tree Plot Assessment**). *Eucalyptus tereticornis* (Forest Red-Gum) made up the largest majority of the trees over 460 mm DBH plotted (48.60%), followed by *Corymbia citriodora* (Spotted Gum) (13.51%) and *Corymbia intermedia* (Pink Bloodwood) (11.89%) (refer **Table A15**). The diameter at breast height (DBH) of these trees varied from 100 mm – 1,690 mm, with the majority (90.75%) of the habitat trees with a DBH less than 800 mm (refer **Table A16**). Within this area 325 hollows were identified (refer **Table A17**). The majority of hollows identified being small (100-200 mm) at 121 (37.23%) and large (>300 mm) at 124 (38.15%), and the balance medium (80, 24.62%, **Table A17**).

From the survey area of 90.4 ha the number of medium and large hollows directly and indirectly impacted is 204.

Table A15: Habitat Tree Plot Summary

Scientific Name	Common Name	Number Recorded	Percentage Recorded (%)
Acacia disparrima	Hickory Wattle	1	0.15%
Angophora leiocarpa	Smooth-barked Apple	49	7.20%
Angophora woodsiana	Smudgee Apple	3	0.44%
Corymbia citriodora	Spotted Gum	92	13.51%
Corymbia intermedia	Pink Bloodwood	81	11.89%
Corymbia tessellaris	Moreton Bary Ash	4	0.59%
Corymbia trachyphloia	Brown Bloodwood	1	0.15%
DEAD/STAG		59	8.67%
Eucalyptus acmenoides	White Mahogany	1	0.15%
Eucalyptus conglomerata	Swamp Stringybark	1	0.15%
Eucalyptus crebra	Narrow-leaved Ironbark	13	1.91%
Eucalyptus microcorys	Tallowwood	2	0.29%
Eucalyptus seeana	Narrow-leaved Red Gum	14	2.06%
Eucalyptus siderophloia	Northern Grey Ironbark	10	1.47%
Eucalyptus tereticornis	Forest Red Gum	331	48.60%
Ficus platypoda	Fig	1	0.15%
Ficus rubiginosa	Port Jackson Fig	1	0.15%
Lophostemon suaveolens	Swamp Box	8	1.17%
Melaleuca quinquenervia	Broad-leaved Paperbark	8	1.17%
Petalostigma pubescens	Quinine Bush	1	0.15%
TOTAL		681	100.00%

Table A16: Habitat Tree Plot DBH Summary

Total DBH (mm)	Number Recorded	Percentage Recorded (%)
0-200	2	0.29%
200-400	24	3.52%
400-600	389	57.12%
600-800	203	29.81%
800-1000	42	6.17%
1000-1200	15	2.20%
1200-1400	3	0.44%
1400-1600	2	0.29%
1600-1800	1	0.15%

Total DBH (mm)	Number Recorded	Percentage Recorded (%)
TOTAL	681	100.00%

Table A17: Size of hollow's identified during Hollow-bearing Tree Plot

Hollow Type	Number Recorded	Percentage Recorded (%)
Small Hollows 0 – 100mm	121	37.23%
Medium Hollows 100 – 300mm	80	24.62%
Large Hollows > 300mm	124	38.15%
TOTAL	**336**	**100%**

3.4.15. Assessment of Survey Adequacy

Koala

Overall, across the survey period (November and December 2022, February and March 2024), a combination of survey methodologies to detect the presence of Koalas onsite were utilised. These included opportunistic daytime searches, activity SAT surveys, spotlighting, deployment of motion sensing cameras and habitat assessment. The survey effort from 2024 included four (4) daytime targeted survey periods and two (2) targeted night time surveys. It is anticipated the combination of these methodologies, which were undertaken in accordance with departmental survey guidelines, provides an adequate survey effort across the site to determine the presence / absence of Koala. Specifically, SAT surveys and targeted Koala surveys were applied to search the site for the potential presence of the Koala in accordance with *EPBC Act Referral Guidance for the Endangered Koala* and *Survey Guidelines for Australia's Threatened Mammals*.

Grey-headed Flying Fox

Spotlighting surveys were completed over two nights in February 2024 for a period of approximately 5 hours with two observers in accordance with the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022). Targeted surveys focused on areas that contain potential Grey-headed Flying-fox foraging habitat, specifically areas that contain flowering eucalypt species such as *Eucalyptus tereticornis* (Forest Red-Gum), *Corymbia citriodora* (Spotted Gum) and *Eucalyptus propinqua* (Small-fruited Grey Gum). Despite targeted survey effort, no Grey-headed Flying-fox individuals were identified foraging within the referral area and no roosts were identified onsite.

Gliders

Species-specific field surveys for determining species presence and habitat suitable for the Gliders were undertaken over a 24-hour period during February 2024 (3-days of field surveys). The diurnal surveys were completed on 13th – 15th February 2024. In addition, spotlighting surveys were completed on 13th and 15th February. The method implemented was an adaptation from *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022), while also meeting the survey standards produced by The Department of Sustainability

and Environment (Victoria, Australia), *Approved Survey Standards: Greater Glider Petauroides volans* (May 2011) (version 1.0). These surveys are applied prior to logging and are considered adequate to detect presence of the species. The surveys included identification of large hollow bearing trees and spotlighting transects covering the entire site. No evidence or direct observation of the species was recorded during extensive field surveys, which indicates a low likelihood of the species presence on-site.

Habitat assessment surveys for the Greater Glider included the identification of all trees containing hollows and all trees with DBH > 460 mm (**Plan A24**). In Queensland, Greater Gliders preferentially select trees > 500 mm for denning and trees of this size are more likely to contain suitable hollows for sheltering (Eyre & Smith *et al.* 2022). Trees > 460 mm were located within the New Beith Road impact area and a 50 m buffer into vegetation either side of the road extent to account for the average large tree benchmark for Queensland Greater Glider Regional Ecosystems (Eyre and Smith *et al.* 2022). As Greater Gliders require hollow-bearing trees for denning, large trees are considered a suitable proxy for potential habitat as these trees have the potential for forming denning resources into the future (Eyre and Smith *et al.* 2022).

Research into the effectiveness of spotlighting in detection for Greater Glider indicated that where the species is present and sufficient survey effort has been given, detection is highly likely (Eyre 2006, Lindenmayer et al. 2001a; Kavanagh 1984). Targeted Glider surveys involved spotlighting on-foot by two (2) SHG ecologists for approximately 5 hours across the New Beith Road impact and buffer areas as per recommended survey guidelines (**Plan A23**). In addition, spotlighting surveys during November and December 2022 were completed for the EPBC referral (refer **Part B MNES Report**).

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 10 0m, 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 where necessary to meet the total of 1 km requirement of the guideline, notably, all transects except Transect 2 exceeds 1 km in length. All fauna species observed located in trees during the transects were recorded. This included birds and frogs as well as arboreal mammals. Raw field data from spotlighting surveys are provided in **Appendix A12**. During the spotlighting surveys, hollows were observed with a spotlight and binoculars. In accordance with the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022) a high-quality pair of binoculars and 14W spotlight was used to detect arboreal species.

The total distance of spotlighting surveys conducted at the site was 13.86 km across two nights with a survey effort of approximately 290 two-person minutes (**Table A18**). While the duration of the surveys do not entirely meet the duration requirements outlined in the Conservation Regulator Victoria Guidance Note: *Reporting detections of Greater Gliders* (2021) (which would be 1,386 minutes for 13.86 km), it is anticipated that 13.86 km survey effort was adequate to identify the presence / absence of Greater Glider and especially Yellow Bellied Glider that is readily locatable across the site and surrounding vegetation. Furthermore, as two observers surveyed the site the total duration of surveys is 580-person minutes in accordance with *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022) which is considered to be adequate to detect the presence of Gliders onsite.

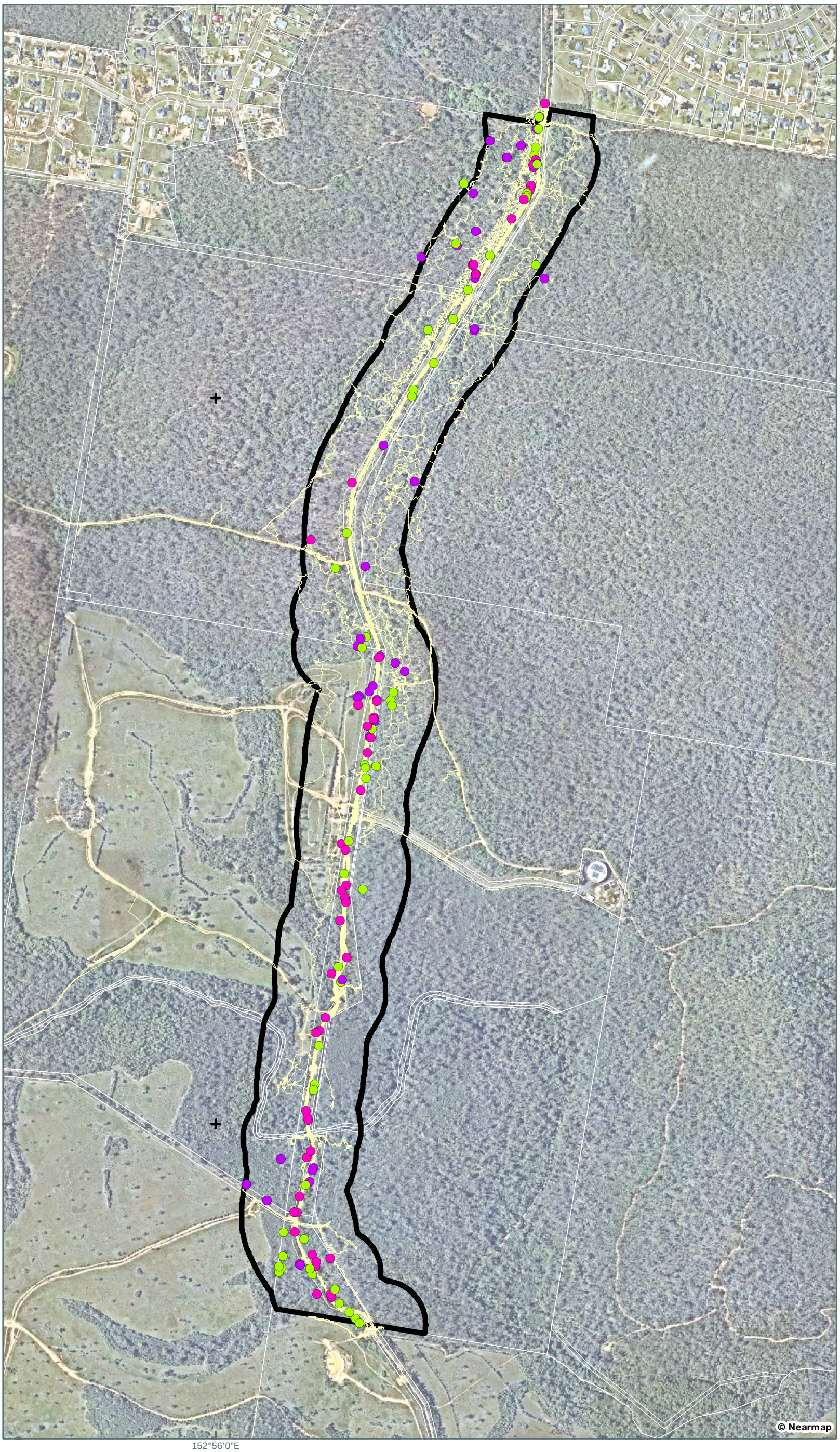
In addition, two observers surveyed the referral area and adjoining vegetation on two (2) separate occasions during the survey period on different nights as per the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022). These surveys included spotlighting close to dusk (< 1 hr after dusk) and later (> 1 hr after dusk) (Eyre and Ferguson *et al.* 2022).

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

Table A18: Greater Glider Survey Guidelines compared to SHG Survey Effort

Transect	Date	Time	Duration	Observers	Distance
Transect 1	13th February 2024	7:00 pm – 9:30 pm	150 minutes	Two (300-person minutes)	10.24 km
Transect 2	15th February 2024	7 pm – 7:30 pm	30 minutes	Two (60 person minutes)	470 m
Transect 3	15th February 2024	7:30 pm – 8:30 pm	60 minutes	Two (120 person minutes)	1.48 km
Transect 4	15th February 2024	8:30 pm – 9:20 pm	50 minutes	Two (100 person minutes)	1.67 km
Total	N /A	N/A	290 two-person minutes	580 person minutes	13.86 km
Survey Guidelines (Victoria)	N / A	10 mins per 100 m	1 hr 40 minutes per transect		1 km per transect
Survey Guidelines (Queensland)			30-person minutes		100 m x 100 m survey site, 100 m per transect

A24. HOLLOW TREE PLOT



Notes:
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Layer Sources

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

- Qld DCDB
- Referral Area
- GPS Track Log

Hollow Tree Plot

- Tree with small hollows (total small hollows: 121)
- Tree with medium hollows (total medium hollows: 80)
- Tree with large hollows (total large hollows: 124)

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	10/07/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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PEET Flagstone City Pty Ltd

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10/07/2025

8418 E A24 NBR Hollows A

3.5.MNES Habitat Assessment

Item 3.5 of the PD Request asks for ***'Based on survey data and with reference to relevant statutory documents, provide a clear description of the total extent and quality of habitat present within and surrounding the proposed action area for each species or ecological community potentially present or impacted by the action. For all species with residual significant impacts the method used to quantitatively assess the quality of habitat must be discussed and endorsed by the department before being applied'.***

No fauna species listed as threatened under the EPBC Act nor State NCA were directly observed on-site. Despite disturbance from 4WD vehicle use, logging and fire resulting in highly modified vegetation values within the New Beith Road referral area, the site was observed to contain some habitat features for a range of wildlife. These features include arboreal termitaria (with and without hollows), hollow-bearing trees, fallen logs and mature canopy trees.

Field surveys verified vegetation communities within the site as containing non-remnant vegetation reflecting pre-clear RE12.9-10.19a, remnant vegetation indicative of RE12.9-10.2, waterways mapped as Category B (remnant) RE12.3.11 / 12.3.7 and remnant RE12.9-10.7. While remnant vegetation is mapped across the site, vegetation is highly disturbed through the road reserve and adjoining vegetation with impacts from clearing, logging, vehicle use and fire, reflected by weed incursion and *Acacia sp.* regrowth dominating some area. The vegetation onsite reflects eucalypt woodland dominated by *Eucalyptus tereticornis*, *Corymbia intermedia* and *Corymbia citriodora*. The site contains suitable habitat features for *Phascolarctos cinereus* (Koala) and potential foraging habitat for *Pteropus poliocephalus* (Grey Headed Flying-fox). There were habitat features in the form of hollow-bearing trees to provide potential habitat for *Petauroides volans* (Greater Glider) and *Petaurus australis australis* (Yellow-bellied Glider), however, due to the significant fragmentation and disturbance of the site these species' are considered unlikely to occur. The site contains marginal foraging habitat for *Calyptorhynchus lathami lathami* (Glossy Black-cockatoo), *Lathamus discolor* (Swift Parrot) and *Anthochaera phrygia* (Regent Honeyeater), however, due to the impact being a lineal strip of vegetation a significant impact is considered unlikely to occur.

A total of 43 fauna species were observed across the site (**Appendix A9**). No EPBC Act nor State NCA species were directly observed on-site. One invasive species, Cane Toad (*Rhinella marina*), was identified during contemporary field survey. In addition, Wild Dog (*Canis sp.*) and *Sus scrofa* (Feral Pig) were also recorded on-site during initial field surveys (**Part B MNES Report**). Within the original referral Ecological Assessment Report, several MNES were identified as having the potential to occur within or abutting the subject site and therefore were targeted as part of the field survey effort (refer **Part B MNES Report**).

This PD will consider Koala and SEFFW TEC as having potential to occur on-site and potentially be impacted by the proposed action. As stated, review of habitat value and usage suggested the action is considered unlikely to have an impact on Greater Glider, South-eastern Glossy Black-cockatoo, Swift Parrot, Regent Honeyeater, Yellow-bellied Glider, Spotted-tailed Quoll and White-throated Needletail, however, assessment against conservation advice and recovery plans suggest a significant impact to some of these matters may be

possible. The quantification of impacts likely to occur on MNES is detailed within **Section 4**, where the avoidance and mitigation measures to be implemented are provided in **Section 5**.

4. Impact Assessment

This section responds to Item 4 of the PD Request which requires an assessment of direct, indirect and facilitated or consequential impacts on listed threatened species and communities as a result of the proposed action and must be assessed in accordance with relevant departmental policies and guidelines, including the SPRAT Database.

'Based on the information provided in the referral, additional information provided in support of the referral, information provided in the SPRAT database, and online observation records, the department considers the proposed action will impact the following matters protected by the EPBC Act:

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

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

- ***Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered***
- ***Koala (Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)) – endangered'***

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

- ***Grey-headed Flying-fox (Pteropus poliocephalus) – Vulnerable***
- ***Greater Glider (Petauroides volans) – Endangered***
- ***South-eastern Glossy Black-Cockatoo (Calyptorhynchus lathami lathami) – Vulnerable***
- ***Swift Parrot (Lathamus discolor) – Critically endangered***
- ***Regent Honeyeater (Anthochaera phrygia)- Critically Endangered***
- ***Yellow-bellied Glider (Petaurus australis australis) – Vulnerable***
- ***Spotted-tailed Quoll (Dasyurus maculatus maculatus) – Endangered***

The following sections contain detailed impact assessment for the above listed MNES matters in response to Item 4 of PD Request.

4.1. General Assessment of Impacts

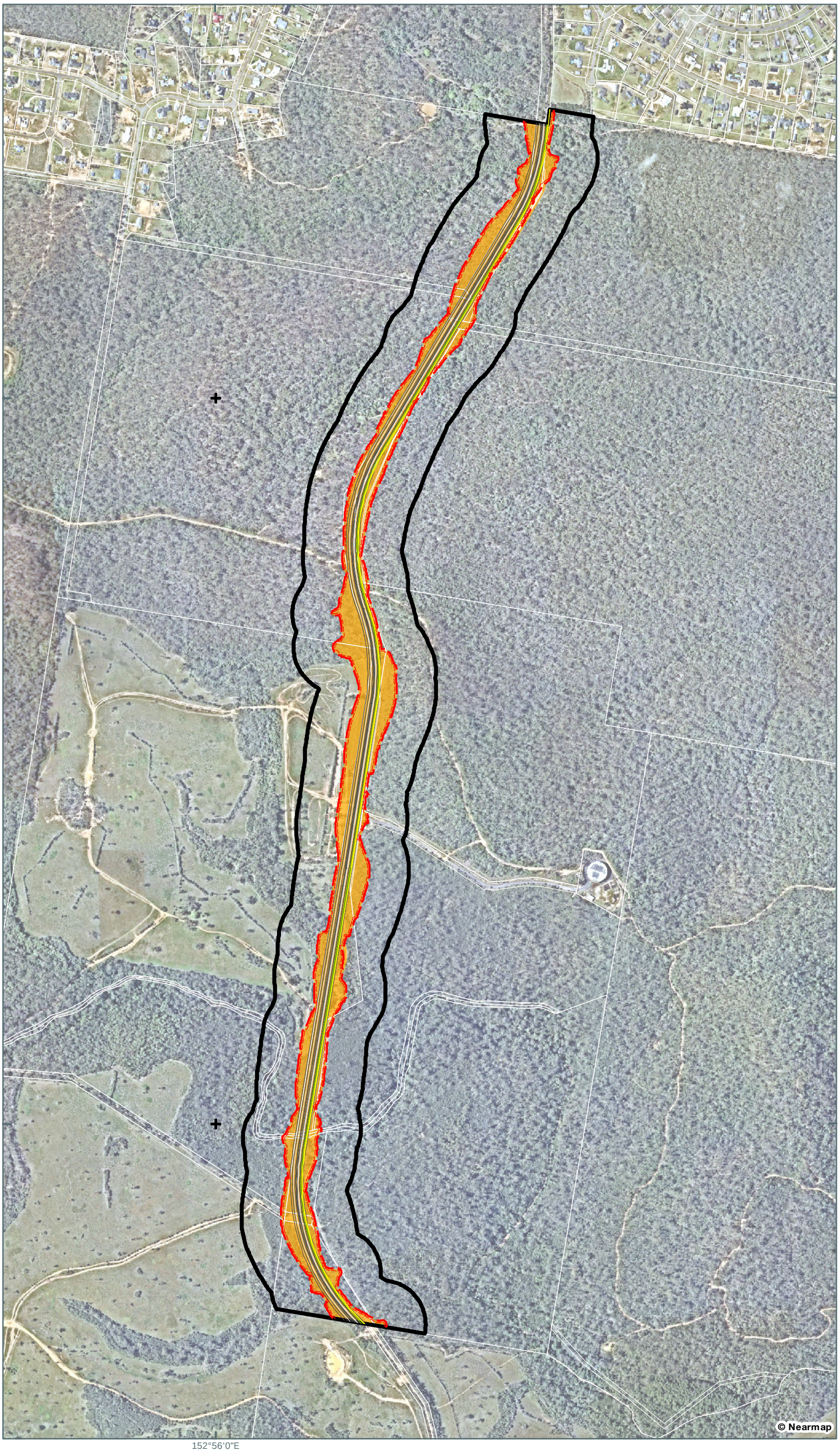
Item 4.1 of the PD Request requires ***'Include a clear description of the total extent and quality of the following:***

k. the total extent of habitat present for each relevant protected matter within the project footprint
l. direct and indirect impact areas (including the total extent of habitat for each relevant protected matter to be impacted, both within and external to the project footprint)
m. Habitat areas to be retained/avoided, and an assessment whether these areas will provide viable habitat (including the total extent of habitat present for each relevant protected matter to be avoided).
n. For Threatened Ecological communities, clearly describe how the habitat on and adjacent to the action area meets the condition thresholds, and whether proposed action will likely result in direct and/or indirect impacts that:
i. increase fragmentation
ii. reduce patch quality
iii. reduce patch size
iv. result in patches too small to be considered habitat'.

4.4.1 Total extent of habitat for protected matters within project footprint

In response to **Item 4.1a** and **b** of the PD Request, the total extent of habitat present for each relevant protected matter within the project footprint is shown on **Plan A6** (TEC) and **Plan A25** (Koala) and for other species in the following sections.

A25. DIRECT IMPACTS



Notes:
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LEGEND

- Qld DCDB
- Referral Area
- Critical Koala habitat directly impacted by works [23.3 ha]

Engineering Detail

- Road Design
- Linemarking Design
- Cycleway Design
- Footpath Design
- Batters
- 5m Construction Buffer

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	16/07/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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16/07/2025

8418 E A25 NBR Direct Impacts A

4.2.MNES Impacts

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

The assessment should include consideration of:

- ***a. the nature, likelihood, significance, and extent of impacts and whether any relevant impacts are likely to be unknown, unpredictable or irreversible.***
- ***b. timing of impacts, and whether the impact is temporary or permanent.***
- ***c. species specific habitat requirements, such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable).***
- ***d. whether connectivity and movement opportunities in the surrounding area may be retained, removed, functionally lost or compromised.***
- ***e. adjacent areas of habitat that may or will be subject to intensification of ongoing impacts (for example, through increased human and vehicle presence)***
- ***f. indirect or facilitated impacts that may result from the proposed action during the pre-construction, construction and operation phases, 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, resulting in disturbance and fauna strike.***
    - ***iii. Increased presence of dogs.***
    - ***iv. Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil.***
    - ***v. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors.***
- ***g. cumulative impacts, where potential project impacts on MNES are in addition to existing impacts of other activities (including current or future developments by the proponent and other proponents in the region and vicinity).***

Refer following Sections.

4.3.Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

4.3.1. TEC Assessment

Item 4.1.d) of the PD Request requires ***'Include a clear description of the total extent and quality of the following:***

d) For Threatened Ecological communities, clearly describe how the habitat on and adjacent to the action area meets the condition thresholds, and whether proposed action will likely result in direct and/or indirect impacts that:

An assessment against the key TEC diagnostic characteristics is provided herein**.** Two patches of vegetation occurring on Landzone 3 and dominated by *Eucalyptus* species are present on-site. Connectivity exists between the two sites, located to the east in vegetation associated with Flagstone Creek. The two patches of vegetation were evaluated against the key diagnostic characteristics (**Plan A6** and **Table A19**).

It is determined that the vegetation patches **do** meet the key diagnostic characteristics as required within the Conservation Advice.

Potential identified patches of the subtropical eucalypt floodplain forest TEC are further assessed through the designation of *minimum condition thresholds*. These thresholds indicate the overall condition and therefore protection status of the patch under the EPBC Act and are determined by the patch size, connected native vegetation and native and exotic vegetation cover within the shrub and ground layer.

On-ground assessments collating habitat quality data were used to assess the two patches of potential TEC against the condition categories, classes and thresholds. Site attributes for Patch 1 and Patch 2 **did** combine to reach the thresholds to be considered a **CLASS B3** patch of the TEC, as protected under the EPBC Act.

Patch 1 (north) covers an area of 0.975 ha within the direct impact site, however, can be considered part of a large patch due to the regulated vegetation mapping associated with Flagstone Creek which extends beyond the buffer and impact area and totals to ≥2 ha (**Plan A6**). Surveys confirmed that Patch 1 meets the criteria for *Condition Class B3* in the '*small contiguous patch – Patch size ≥0.5, within a larger area of native vegetation ≥5'*.

Patch 1 assessed within Transect 4 meets the Vegetation Criteria '*Good Condition'* as it meets the threshold of ≥10 large native trees[2] per ha and has ≥ 50% of its total perennial understory vegetation cover comprising of native species (refer **Appendix A10** for transect data).

Patch 2 covers an area of 0.547 ha within the direct impact site, however, can be considered part of a large patch due to the regulated vegetation mapping associated with Flagstone Creek which extends beyond the buffer and impact area and totals to ≥2 ha (**Plan A6**). Native canopy trees exist to the east and west vegetated areas maintaining connectivity. This area is also considered to contain at least 50% or more native species, therefore Patch 2 is considered to form a Large Patch.

As such, Patch 2 could be considered as potentially a class of the '*small contiguous patch – Patch size ≥0.5, within a larger area of native vegetation ≥5'* Category.

Surveys confirmed that Patch 2 meets the *Condition Class C2* '*Moderate Condition'* in the '*small contiguous patch – Patch size ≥0.5, within a larger area of native vegetation ≥5'* Category, due to a sufficient number of large native trees per hectare and the percentage native perennial understory vegetation cover within T7 (**Appendix A10**).

Both patches are considered to meet the minimum condition thresholds required in order to be considered the Subtropical eucalypt floodplain forest and woodland of the New South Wales Coast and South East Queensland bioregions TEC.

Table A19: Condition categories, classes and thresholds

Biotic thresholds ↓ / Patch size thresholds →		**Large patch** Patch size ≥2 ha	**Small contiguous[4] patch** ≥ 0.5 ha, within a larger area of native vegetation ≥ 5 ha	**Small patch** Patch size ≥ 0.5 ha
Vegetation	**Arboreal mammals**			
HIGH CONDITION Ground cover richness[1] ≥ 10 native species per sample plot **AND** ≥ 20 large native trees[2] per ha. **AND** ≥ 80% of its total perennial understorey vegetation cover[3] comprises native species		**CLASS A1** Large or contiguous[4] patch, with high quality understorey and many large native trees		**CLASS B1** Small patch, with high quality understorey and many large native trees
GOOD CONDITION Ground cover richness[1] ≥ 6 native species per sample plot **AND** ≥ 10 large native trees[2] per ha. **AND** ≥ 50% of its total perennial understorey vegetation cover[3] comprises native species	**AND** ≥5 species of arboreal mammals[5] detected[6] in the patch.	**CLASS A2** Large or contiguous[4] patch, with good quality understorey, large native trees and evidence of many arboreal mammal species		**CLASS B2** Small patch, with good quality understorey, large native trees and evidence of arboreal mammals
		CLASS B3 Large or contiguous[4] patch, with good quality understorey and large native trees		**CLASS C1** Small patch, with good quality understorey and large native trees
MODERATE CONDITION Ground cover richness ≥ 4 native species per sample plot[1] **AND at least one of:** ≥ 6 very large native trees[7] per ha **AND/OR** ≥ 30% of its total perennial understorey vegetation cover[3] comprises native species		**CLASS C2** Large or contiguous[4] patch, with moderate quality understorey and/or some very large native trees		Not nationally protected

Notes

[1] Ground cover richness includes combined species richness of native grasses, forbs, ferns and sedges per 0.04 ha (20 x 20 m sample plot) on average.

[2] Large native trees are greater than 45 cm [diameter at breast height (dbh)]. This is used as a surrogate for tree hollows and other habitat values. These should be counted, and averaged across the patch as a whole. For larger patches, they can be counted in plots of at least 0.5 ha.

[3] Perennial understorey vegetation cover includes all vegetation below the canopy layer, from species with a life-cycle of more than two growing seasons. It includes herbs (graminoids and forbs), grasses, shrubs, shorter trees, juvenile canopy species, resprouting or suckering of the lower portions of canopy trees, and cryptograms; but it does not include annual plants, plant litter, or exposed soil.

[4] Contiguous means the patch is connected to, or in close proximity to (i.e., within 30 m of), one or more areas of native vegetation (i.e., an area where the total perennial vegetation cover is dominated (50% or more) by native plant species).

[5] For the purposes of this calculation, evidence of any number of micro-bat species (Microchiroptera) found in the patch counts as one species of arboreal mammal.

[6] Survey guidelines include DSEWPC (2011).

[7] Very large native trees are greater than 60 cm dbh. These should be counted, and averaged across the patch as a whole. For larger patches, they can be counted in plots of at least 0.5 ha (i.e., an average of 3 very large native trees per 0.5 ha plot).

4.3.2. Significant Impact Assessment

Assessment against the Significant Impact Guidelines 1.1 for the SEFFW TEC

The SEFFW TEC is listed as Endangered under the EPBC Act, effective as of 5th October 2022. Therefore, any assessed impact of a proposed action on-site would trigger the proponent to make a further subsequent decision regarding whether or not to refer the action.

As detailed in **Section 4.3.2**, the SEFFW TEC was ground-truthed within the waterway corridors, intersecting part of the referral area (**Plan A6**). Species identified within the SEFFW TEC's were reflective of the Of Concern RE12.3.11– refer **Section 4.3.2** for flora species and indicators of the SEFFW TEC observed within the proposed action area. To determine whether or not the proposed action is likely to have a significant impact on the SEFFW TEC, an assessment against the *EPBC Significant Impact Guidelines 1.1* is presented below.

SEFF TEC Significant Impact Assessment

Conservation Status – The *Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions* (SEFFW) is listed as Endangered under the EPBC Act.

Description – The SEFFW TEC varies from a tall open forest to woodland, dominated by eucalypts and/or other myrtaceous trees specifically from the *Angophora*, *Corymbia*, *Lophostemon* and *Syncarpia* genera which occurs on alluvial landforms.

Distribution, Location and Physical Environment – The SEFFW TEC occurs in the New South Wales North Coast (NNC) and South Eastern Queensland (SEQ) IBRA bioregions and on Curtis Island in the Brigalow Belt North (BBN) IBRA Bioregion. This encompasses an area from just north of Newcastle, New South Wales (around Raymond Terrace) in the south, to just north of Gladstone in Queensland.

The ecological community is found on alluvial landforms, including floodplains, the riparian zones of parent rivers and other order tributaries, alluvial flats, floodplain/alluvial terraces and periodically flooded depressions. It generally occurs below 50 m above sea-level (ASL), although it can occur up to 250 m ASL.

Threats – Threats to this TEC include clearing, hydrological changes, fragmentation legacies, weeds, climate change, fire regimes that cause declines in biodiversity, invasive fauna, disturbance from urbanisation and recreational activity, diseases and pathogens, livestock grazing, vegetation and firewood removal and urban heat effects.

To determine whether the proposed action is likely to have a significant impact on the SEFFW TEC, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

1. Reduce the extent of an ecological community

Assessment: The potential SEFFW TEC was ground-truthed in association with Flagstone Creek and a tributary of this creek to the north (**Plan A6**). Part of the referral area intersects vegetation described as the RE 12.3.11 / 12.3.7 which are Regional Ecosystems representative of the

SEFFW TEC. The potential TEC exists as a thin remnant corridor in association with Flagstone Creek. In its existing state, vegetation is affected by edge effects on both side as a result of historical clearing and cattle grazing, along with direct effects of the existing road reserve including weed incursion, logging and vehicle damage. Resultantly, weed invasion was observed along the edges of the community where the existing road reserve intersects. The proposed action will result in the direct impact of approximately 1.5 ha of the potential SEFFW TEC due to the construction of a road crossing over Flagstone Creek. It is noted, while the RE12.3.11 / 12.3.7 is mapped through the entire works extent and buffer area, the mapping is not considered entirely accurate as there is an existing cleared track through the centre of the works extent. Although the proposed action is considered to result in a minimal reduction of the potential TEC, there is potential for significant impact given the clearing of vegetation in association with this TEC is unavoidable.

2. Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Assessment: The potential SEFFW TEC is proposed to be impacted as a result of the development. In its existing state, the potential SEFFW TEC is restricted to two narrow lineal strips associated Flagstone Creek (**Plan A6**). Edge effects are evident in the form of weed invasion and ongoing impacts resulting from illegal vehicle use, rubbish dumping and logging. The area of direct impact by the construction of a road crossing is approximately 1.5 ha which includes highly modified areas due to historical disturbance within abutting landscape areas (e.g. agricultural uses and land clearing) and impacts within the works extent due to the existing cleared road and tracks. The remainder of the potential SEFFW TEC adjacent to the referral area is proposed to be retained and rehabilitated as a result of the action. The areas abutting the buffer will undergo rehabilitation efforts following development works which aim to conserve the ecological processes associated with the SEFFW TEC (i.e. faunal habitat and connectivity opportunity to surrounding remnant vegetation). The TEC currently experiences some fragmentation due to the cleared areas in association with the existing road reserve, however, there is potential for this to increase with the proposed road upgrade works.

3. Adversely affect habitat critical to the survival of an ecological community

Assessment: The potential SEFFW TEC was ground-truthed in association with Flagstone Creek and a tributary of this creek to the north (**Plan A6**). Part of the referral area intersects vegetation described as the RE 12.3.11 / 12.3.7 that are regional ecosystems representative of the SEFFW TEC. The potential TEC exists as a thin remnant corridor through Flagstone Creek. In its existing state, vegetation is affected by edge effects on both side as a result of historical clearing and cattle grazing, along with direct effects of the existing road reserve including weed incursion, logging and vehicle damage. Weed invasion was observed along the edges of the community where the existing road reserve intersects as a result of ongoing edge effects – where increased light exposure and the cleared track has facilitated weed growth. Approximately 1.5 ha of the potential SEFFW TEC is proposed to be directly impacted as a result of the proposed action. It is worth noting that the works extent is

occurring over an existing cleared area which presently fragments areas of the ecological community. Furthermore, areas adjacent to the impact area along Flagstone Creek are proposed to undergo rehabilitation works as part of the action. The TEC will persist post development preserved within ecological corridors as designated under the GFPDA. As the patch is considered Class B3 under the conservation advice it is considered habitat critical to the survival of the TEC. The proposed direct clearing of 1.5 ha of the TEC will have an adverse effect on habitat critical to the survival of the TEC.

4. Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

Assessment: The potential SEFFW TEC was ground-truthed in association with Flagstone Creek and a tributary of this creek to the north (**Plan A6**). The potential TEC exists as a thin remnant corridor in association with Flagstone Creek. The existing condition of the TEC is highly modified, where vehicle usage along an existing cleared track was observed, resulting in varied levels of erosion (ranging from moderate to high). A direct impact of approximately 1.5ha is proposed as a result of the action, to facilitate a road crossing intended to connect proposed development within Greater Flagstone PDA. Due to the narrow width of the potential SEFFW TEC, observable erosion and weed invasion, ecological processes are largely hindered – such as water filtration, significant nutrient cycling and soil stability. Consequently, the proposed action is not anticipated to modify or destroy abiotic factors, as best practice mechanisms and standards will be implemented during works associated with the proposed action. In addition, the proposed action will include the rehabilitation of the adjacent Flagstone Creek and tributary to provide an enhanced buffer to the TEC long-term. It is unlikely that the action will result in alterations to ecosystem processes and functionality. Existing contours within the SEFFW TEC will remain, minimising the potential for modification of current ecosystem functionality. Hence, the proposed action is unlikely to modify or destroy abiotic factors essential to the potential SEFFW TEC.

5. **Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting**

Assessment: The potential SEFFW TEC was ground-truthed in association with Flagstone Creek at the southern extent of the proposed works extent (**Plan A6**). During detailed field assessment, the broader indicator regional ecosystem, composite Of Concern RE12.311 / 12.3.7, was observed finding areas within the impact site which meet condition thresholds as discussed in **Section 4.3.1**. Within the area evidence of historical disturbance is observed including weed invasion. Species including *Lantana camara* (Lantana), *Ageratum houstonianum* (Blue Billygoat Weed), and *Megathyrsus maximus* (Guinea Grass) exist throughout the area. The direct impact to approximately 1.5 ha of the potential SEFFW TEC is not considered to result in a substantial change in species composition through the increase in clearing or increase weed species. additional edge effects are planned to be avoided and mitigated where possible through weed management practises. As part of

development, rehabilitation efforts are proposed to remove weed species and rehabilitate and enhance the areas of existing TEC adjacent to site. The site is already a public road that could potentially allow harvesting of species. Hence, it is not anticipated that the proposed action will result in substantial changes to species composition nor result in a reduction of species diversity or presence.

6. Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
– assisting invasive species, that are harmful to the listed ecological community, to become established, or
– causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community

Assessment: Fragmentation, weeds, fire regimes that cause declines in biodiversity, invasive fauna, and disturbance from recreational activity, are included within the key threatening processes that are considered relevant to the potential SEFFW TEC DCCEEW (2022). Field survey recorded Wild Dog (*Canis lupus familiaris*) and Lantana (*Lantana camara*) within the proposed action boundary, indicating the potential SEFFW TEC on-site is already exposed to harm from invasive species. Lantana is listed as a key damaging weed species that is known to infest this TEC, and must be managed to prevent impacts to the integrity of the potential SEFFW TEC. As a result of the proposed action, pest management mechanisms will be implemented to reduce existing threats. Further, the proposed action is not anticipated to result in an increase of invasive species within the potential SEFFW TEC due to the existing invasive species presence due to the weed management practises during clearing and post rehabilitation.

Works associated with the proposed action are not anticipated to result in regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the TEC. Best practice mechanisms and standards will be implemented during works associated with the proposed action to ensure no runoff with the potential to inhibit or kill the growth of species associated with the TEC occur as per stringent GFPDA guidelines. Further, the retention and rehabilitation of the TEC area in the adjacent Flagstone Creek corridor post-works will enhance water filtration processes and support ecosystem health and functionality.

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

Assessment: Field survey recorded Wild Dog and Lantana (*Lantana camara*) within the proposed action boundary, indicating the potential SEFFW TEC on-site is already exposed to harm from invasive species. Lantana is listed as a key damaging weed species that is known to infest this TEC, and must be managed to prevent impacts to the integrity of the potential SEFFW TEC. As a result of the proposed action, pest management mechanisms will be implemented to reduce existing threats. Further, the proposed action is not anticipated to result in an increase of invasive species within the potential SEFFW TEC due to the current

existence of invasive species and subsequent rehabilitation efforts within the potential TEC and abutting the lineal strip.

8. Interfere with the recovery of an ecological community.

Assessment: The potential SEFFW TEC was ground-truthed to be largely restricted to two small areas in association with Flagstone Creek (**Plan A6**). As a result of the proposed action, the regional ecosystem associated with the TEC, Of Concern composite RE12.3.11 / 12.3.7, is proposed to undergo some clearing, however, the existing connectivity is limited due to current road use and cleared area which occurs through the centre of the impact area. A disturbed part of the TEC is proposed to be impacted as a result of the construction of a road crossing to connect the development within Greater Flagstone PDA. A total of approximately 1.5 ha is proposed to be directly impacted. Post-development rehabilitation works will occur to remove weed species adjoining the impact area. Hence, the proposed action is not anticipated to interfere with the recovery of the TEC.

4.3.1. Discussion - Quantum of Impact

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

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

Modified Habitat Quality Assessment

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 methodology recognises the following three (3) key indicators:

1. site condition – a general condition assessment of vegetation compared to a benchmark;
2. site context – an analysis of the site in relation to the surrounding environment; and
3. species habitat index – the ability of the site to support a species.

The modified habitat quality assessment (MHQA) for the TEC uses Site Condition and Site Context attributes from the Queensland State Government guide into two (2) (site condition and site context) with each being

weighted 70% and 30% of the final score, respectively. The higher weighting is attributed to Site Condition based largely on the attributes utilised to discern the condition categories, classes and thresholds under the relevant conservation advice (**Table A19**).

The following section details the methodology utilised to assess the Site Condition and Site Context.

Site Condition (70 %)
Assessing site condition is an integral step in determining specific quantification of impacts, while also determining whether an offset site is suitable to establish a desired capacity to support the prescribed environmental matters being offset. The on-site condition is a key element of habitat quality and has a direct influence on the biodiversity it supports. Site condition is assessed using a suite of attributes to describe the structure and function of the vegetation community and is benchmarked against the expected range for a relatively undisturbed community.

The site condition assessment under the MHQA is assessed using fifteen (15) condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;
- large trees;
- coarse woody debris;
- non-native plant cover;

Assessment of the above condition characteristics do not differ from the traditional habitat quality assessment. Scoring tables for the site condition attributes follows the scoring tables within the BioCondition manual (refer above).

A total of two (2) MHQA transects were completed within the TEC. Refer **Plan A4** for location of MHQA transects.

Site Context (30 %)
The site context assessment deals with the site and its adjacent surroundings. Site context is measured using attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. Under this MHQA, site context is measured using the following six (6) characteristics considered relevant to a TEC but derived from the Koala context assessment, with the attributes typically applied to fauna (species mobility capacity) not utilised:

- size of patch (refer **Plan A26**);
- connectedness (refer **Plan A26**);
- context (refer **Plan A26**);
- ecological corridors (refer **Plan A26**);
- role of site; and
- threats to species

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat. MNES habitat was determined using the combination of the Unsupervised Classification tool within ESRR's ArcGIS software and the most recently available aerial photograph from Nearmap.com. The Unsupervised Classification tool is able to determine vegetation areas through the near infrared (NIR) composite band of the Landsat 8 imagery available online. The tool is able to create a dataset of vegetation areas without the analyst's intervention providing a rapid method for mapping habitat critical to the survival of the Koala over large regions such as South East Queensland. Nearmap.com aerial image is used for calibration purposes, particularly when dealing with smaller scale EPBC assessment areas. The dataset created by the Unsupervised Classification tool is revised using the latest aerial imagery available from Nearmap.com at scale of 1:40,000 and provides a more accurate depiction of habitat for EPBC referrals.

Assessment methodology for the site context assessment is outlined below:

1. patch size – The calculation of the area of the patch size uses the method outlined in the BioCondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors.
2. connectedness – Connectivity relates to the connected attributes of the habitat through the landscape. The attribute is calculated using GIS by measuring the length of habitat that is along the boundary of the site.
3. context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. The attribute is measure of the percentage of habitat within a 1 km buffer of the site.
4. ecological corridors – This attribute is as per the methods of the *Guide to determining terrestrial habitat quality V1.2* and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). The ecological corridors have been mapped by the Queensland State Government under the 'CORR_TYPE' attribute table. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.
5. 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 effect damage to, or removal of the site would have to the likelihood of the species' overall population survival.

6. threats to species – Threats to the TEC are predominantly clearing, hydrological changes, fragmentation legacies, weed infestation, climate change, fie regimes, invasive fauna, disturbance, disease, livestock grazing, firewood harvesting and urban heat effects. Scoring methodology for threats to the TEC on site includes justification for a final score in line with Table 4 of the *"Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy"* Version 1.2 April 2017.

Impact Assessment

The habitat quality scores for the assessment unit, combining Site Condition and Site Context are reported in **Table 20**. The scores for Site Condition are derived directly from the MHQA Tool data.

Site Condition (70%)

AU3 (Remnant RE12.3.11) achieved an average score for Site Condition of **3.81** out of 7.

The transects generally scored poorly for grass species richness, native grass cover, large trees per ha, coarse woody debris and non-native plant cover. Refer to **Appendix A10** for raw MHQA data and photos facing north, south, east and west captured at the 50 m transect mark for each transect.

Site Context (30%)

The results of the habitat context assessment are present in **Plan A26**. The patch size was determined to be 90 hectares. The percentage of boundary length of the impact was calculated at 6% and the percentage of habitat within 1 km of the impact site is 6%.

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 connected to the site in this instance. This attribute is scored such that is reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable regional ecosystems. The size of patch attribute was calculated using GIS, and achieved a score of 5 out of 10 as the site of habitat patch was calculated to be 90 ha (between 26 and 100 ha as per the *Queensland BioCondition Assessment* methodology (**Plan A26**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected with adjacent native vegetation. Connectedness relates to the relative connection between sustainable patches of habitat, and therefore has important implications for persistence. Connectedness was calculated using GIS, with the percentage of project area boundary length supporting habitat connection off and on-site was calculated at 6%, and consequently this attribute scored a 0 out of 5 (**Plan A26**).

Context

The context attribute refers to the amount of habitat that is retained within a 1 km buffer of the site being assessed and is calculated using GIS. Retained habitat within a 1 km buffer of the site was calculated at 6%, and therefore the context attribute achieved a score of 0 out of 5 (**Plan A26**).

Ecological Corridors

GIS mapping was utilised to identify the site's role in any ecological corridors on or adjacent to the site (refer **Plan A26**). The site does not form part of any mapped ecological corridors. Therefore, this attribute was scored 0 out of 6.

Role of site location to species overall population in the state

This attribute aims to quantify the geographical importance of the site for the TEC across the broader state. This attribute achieved a score of 5 out of 5 given the site contains habitat critical to the survival of the TEC.

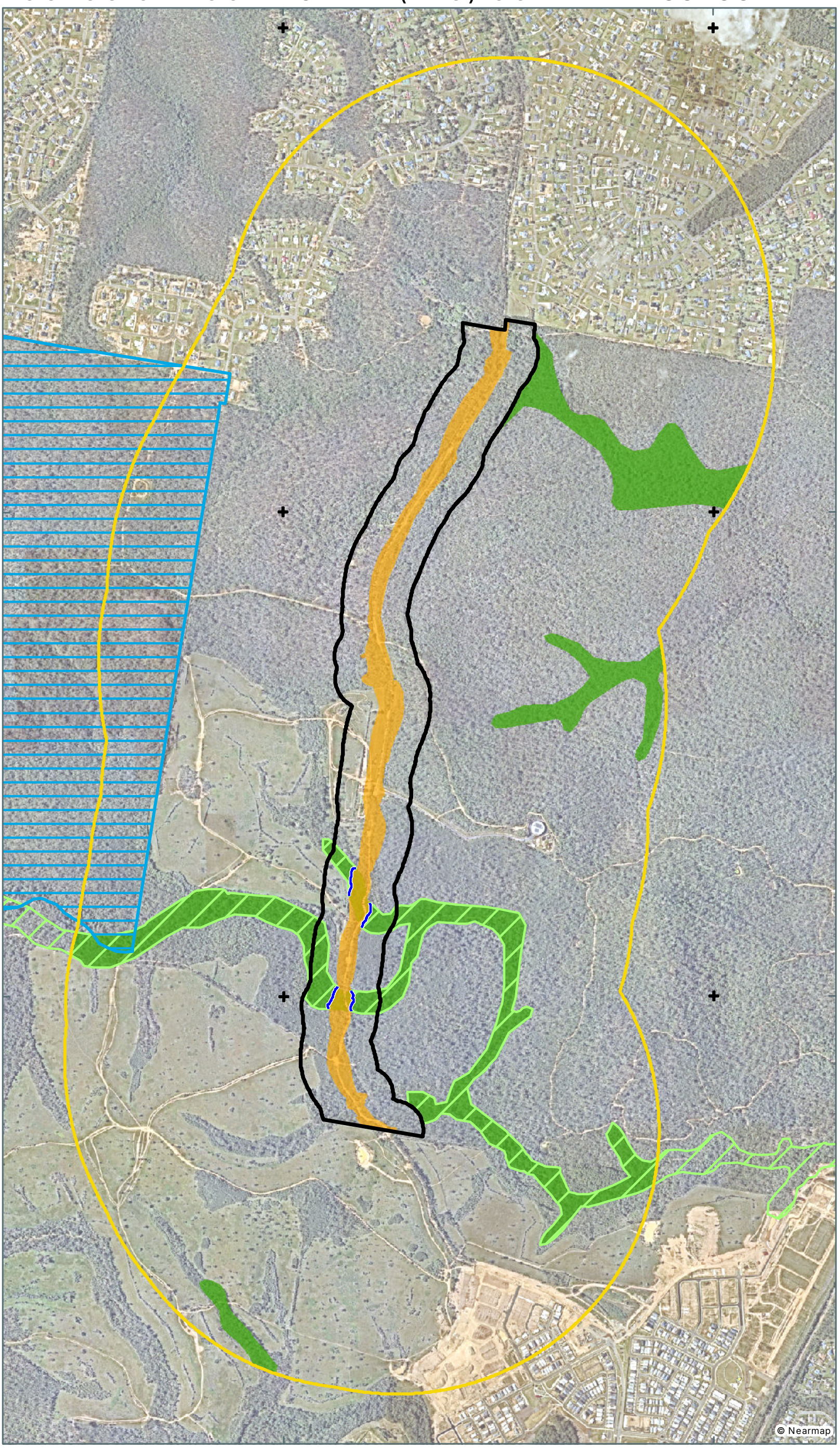
Threats to the species

The threats to the species attribute aims to quantify the risk to survival of the TEC on-site. Key known threats to the survival of the TEC include clearing, hydrological changes, fragmentation legacies, weed infestation, climate change, fie regimes, invasive fauna, disturbance, disease, livestock grazing, firewood harvesting and urban heat effects. The TEC on-site has been subject to clearing for previous timber harvesting and pastoral uses that has also introduced weeds, and is marginally fragmented by the existing fire trail and creek crossings. As such, threats to the TEC have been scored moderate at 7.

Summary

To summarise, the action is considered to impact on moderate quality TEC, having a total impact of **4.91 out of 10** (**Table A20**).

A26. POTENTIAL SUBTROPICAL EUCALYPT THREATENED ECOLOGICAL COMMUNITY (TEC) CONTEXT ASSESSMENT



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

Layer Sources

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

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Updated data available at

http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- Referral Area
- Regional biodiversity corridor (SEQ Regional Plan 2017)
- Direct Impact
- 1km buffer
- Percentage boundary length supporting a connection off and on site to Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion - 6%
- Percentage of Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion within 1km of referral area - 6%
- Size of Potential Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregion patch - 90ha

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:15,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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New Beith Road

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15/10/2025

8418 E A26 NBR TEC Context A

Table A20: TEC MHQA Impact Assessment

Assessment Unit - Regional Ecosystem - TEC	AU 3 - Cat B - Remnant vegetation associated with Flagstone Creek (RE12.3.11/12.3.7)					
	RE12.3.11 Benchmark	Transect 4	Transect 7	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	0	**50**	50	**3**
Native plant species richness - trees	**7**	4	8	**6**	85.71	**2.5**
Native plant species richness - shrubs	**7**	3	4	**3.5**	50.00	**2.5**
Native plant species richness - grasses	**12**	2	2	**2**	16.67	**0**
Native plant species richness - forbs	**25**	6	11	**8.5**	34.00	**2.5**
Tree canopy height (Canopy)*	**23**	23	19	**21**	91.30	5
Tree canopy height (Sub-canopy)*	**8**	8	14	**11**	137.50	5
					***Average tree canopy height**	**5**
Tree canopy cover (Canopy)**	**56**	63.7	28.2	**45.95**	82.05	5
Tree canopy cover (Sub-canopy)**	**33**	52.3	79.5	**65.9**	199.70	5
					****Average tree canopy cover**	**5**
Shrub canopy cover	**20**	21.4	16.5	**18.95**	94.75	**5**
Native grass cover*	**44**	8	67	**37.5**	85.23	**3**
Organic litter*	**37**	57	6	**31.5**	85.14	**5**
Large trees (euc plus non-euc) (per ha)	**30**	14	8	**11**	36.67	**5**
Coarse woody debris (per ha)	**555**	289	178	**233.5**	42.07	**2**
Non-native plant cover	**0**	30	25	**27.5**	27.50	**3**
					Site Condition Score (/100)	**43.5**
					Overall Site Condition Score - out of 7	**3.81**
SITE CONTEXT						
Size of patch	**10**	5	5	5		**5**
Connectedness	**5**	0	0	0		**0**
Context	**5**	0	0	0		**0**

Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
					Site Context Score (/46)	**17**
					Overall Site Context Score - out of 3	**1.11**
Overall Assessment Unit Score						**4.91**

4.4. Koala (*Phascolarctos cinereus*)

4.4.1. Direct Impacts

The habitat critical to the survival of the Koala present onsite and impacted is presented in **Plan A27**. The site was assessed using a modified version of the Queensland State Governments "*Guide to determining terrestrial habitat quality: A toolkit for assessing land-based offsets under the Queensland Environmental Offsets Policy*" Version 1.2 April 2017 (the terrestrial habitat guideline). The purpose of the Guideline is to provide a methodology for proponents to measure the habitat quality of a land-based offset under the Queensland Environmental Offset Policy (QEOP). This methodology has been adopted and modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES) as a result of the road upgrade.

4.4.2. Assessment Methodology

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

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

Assessment Units

The variance in quality of habitat on an impact or offset site is accounted for by delineating sites into assessment units (AUs). AUs are mapped to determine where the sample sites will be and how many are required to adequately assess the site's condition. AUs can be defined using desktop information but can be refined during field surveys where appropriate. In general, they are to be relatively homogenous, defined by a distinct regional ecosystem or habitat type and distinct from other patches of vegetation on the site. The AUs identified are used in the assessment of habitat values for Koala.

The vegetation on-site is considered to be representative of the pre-clear and current regional ecosystems mapped across the site, which have been delineated into five (5) assessment units (**Plan A4**) and refined to the impact area for this assessment (**Plan A27**).

Modified Habitat Quality Assessment

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 methodology recognises the following three (3) key indicators:

1. site condition – a general condition assessment of vegetation compared to a benchmark;
2. site context – an analysis of the site in relation to the surrounding environment; and
3. species habitat index – the ability of the site to support a species.

The modified habitat quality assessment (MHQA) for the Koala used here combines the three (3) key indicators from the Queensland State Government guide into two (2) (site condition and site context) with each being weighted 30% of the final score. The balance of the weighting, 40%, has been attributed to the third indicator (species stocking rate), that is independent of the Queensland State Government habitat quality assessment. The species stocking rate has been added to the MHQA to better incorporate MNES, and specifically the vulnerable *Phascolarctos cinereus* (Koala). The following subsections detail the methodology utilised to assess the site condition, site context and species stocking rate under the Koala MHQA.

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

Site Condition (30 %)

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

The site condition assessment under the MHQA is assessed using fifteen (15) condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;
- large trees;
- coarse woody debris;
- non-native plant cover;
- quality and availability of food and foraging habitat; and
- quality and availability of shelters.

Assessment of the above condition characteristics do not differ from the traditional habitat quality assessment. Scoring tables for the site condition attributes follows the scoring tables within the BioCondition manual (see above). In developing the MHQA to better incorporate MNES, two (2) species habitat index characteristics, being, (1) quality and availability of food and foraging habitat, and (2) quality and availability of shelter have been added to the site condition indicator. The two Koala habitat index attributes are based on the balance site condition attributes as listed, being species recruitment through to non-native plant cover, where the scores for each of these attribute are summed to provide a data driven condition attribute score out of 80. Scoring for quality and availability of food and shelter is then attributed as follows; the bottom 33% (or <27/80) scores 1, the middle 33% (or between 27/80 and 54/80) scores 5 and the top 33% (or >54/80) scores 10. Site condition drivers therefore determine the habitat quality indices of food and shelter in a repeatable metric.

A total of eight (8) MHQA transects were completed across the site on 26 February, and 1, 4 and 5 March 2024. Refer **Plan A4** for location of MHQA transects.

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 MHQA, site context is measured using the following seven (7) characteristics:

- size of patch (refer **Plan A28**);
- connectedness (refer **Plan A28**);
- context (refer **Plan A28**);
- ecological corridors (refer **Plan A29**);
- role of site location to species overall population in the state;
- threats to the species; and
- species mobility capacity.

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Koala habitat. Whilst remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas can utilise areas of non-remnant vegetation or high value regrowth vegetation that does not yet achieve remnant status. Therefore, site context under the MHQA accounts for surrounding Koala habitat rather than remnant vegetation.

Habitat critical to the survival of the Koala was determined using the combination of the Unsupervised Classification tool within ESRR's ArcGIS software and the most recently available aerial photograph from Nearmap.com. The Unsupervised Classification tool is able to determine vegetation areas through the near infrared (NIR) composite band of the Landsat 8 imagery available online. The tool is able to create a dataset of vegetation areas without the analyst's intervention providing a rapid method for mapping habitat critical to the survival of the Koala over large regions such as South East Queensland. Nearmap.com aerial image is used

for calibration purposes, particularly when dealing with smaller scale EPBC assessment areas. The dataset created by the Unsupervised Classification tool is revised using the latest aerial imagery available from Nearmap.com at scale of 1:40,000 and provides a more accurate depiction of habitat critical to the survival of the Koala at the assessment scale for EPBC referrals.

Assessment methodology for site context assessment for Koala is outlined below:

1. patch size – The calculation of the area of the patch size uses the method outlined in the BioCondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors.
2. connectedness – Connectivity relates to the capacity that the species have to disperse through the landscape. The attribute is calculated using GIS by measuring the length of Koala habitat that is along the boundary of the site.
3. context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. The attribute is measure of the percentage of Koala habitat within a 1 km buffer of the site.
4. ecological corridors – This attribute is as per the methods of the *Guide to determining terrestrial habitat quality V1.2* and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, for example, Koala, this is not their primary function when assessing the attribute. The ecological corridors have been mapped by the Queensland State Government under the 'CORR_TYPE' attribute table. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.
5. 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 effect damage to, or removal of the site would have to the likelihood of the species' overall population survival.
6. threats to species – Threats to Koala are predominantly, habitat loss, car strike, dog attack and disease. 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 1500 m of the site boundary. A risk matrix relative to the conservation advice for the Koala was applied to determine threats to species:
    - Habitat loss is considered Very High Risk under the Koala conservation advice. Clearing and degradation of habitat is scored Low, Moderate and High and weighted according to risk factor relative to the expected threat score for each (summed vertically as 15 for Low, 7 for Moderate or 1 for High).
    - High intensity bushfire is considered Very High Risk under the Koala conservation advice. Inappropriate fire regimes is scored Low, Moderate and High relative to the implementation of an

endorsed bushfire management plan and fuel load weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).

- Vehicle strike is considered Moderate Risk under the Koala conservation advice. Vehicle strike is scored Low, Moderate and High relative to the presence and severity of road use within 1 km of the site 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).

7. species mobility capacity – This attribute is a measure of the presence and severity of factors that would contribute to a reduction in mobility of Koala and is scored on the presence of roads or large cleared areas bordering the site.

In developing the MHQA, three (3) species habitat index characteristics were nominated — role of site location to overall species population in the state, threats to the species and species mobility capacity.

Species Stocking Rate (40 %)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. Given the discreet nature of the Koala and limited to no published literature on habitat carrying capacity of the species, the species stocking rate scoring methodology has been derived through the collation of site-specific surveys and surrounding contextual habitat analysis.

Species stocking rate is calculated using the following parameters:

- Species presence on or adjacent to the site
- Species usage of the site
- Approximate density of the species on the site
- Role/importance of species population on-site

Baseline Koala activity levels were determined through utilising the Spot Assessment Technique (SAT) (Phillips *et al*. 2011). The SAT method is an industry recognised technique for identifying presence/absence of Koala at a site and is specified as an appropriate survey method in the former *EPBC Act Referral Guidelines for the Vulnerable Koala*. Results from the SAT surveys are compared against current available published scientific literature to identify an estimated Koala carrying capacity (stocking rate) to be determined. The SAT methodology is explained in further detail in **Section 3.4.6**. **Table A21** outlines the attributes utilised to assess species stocking rate.

Table A21: Species Stocking Rate Scoring

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	/10
Species usage of the site (habitat type and evidenced usage)	/15

Species Stocking Rate Table	
Approximate density (per ha)	/30
Role/importance of species population on site*	/15
Total Species Stocking Rate Score	/70
Species Stocking Rate Score – out of 4	

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

Scoring Weight Justification

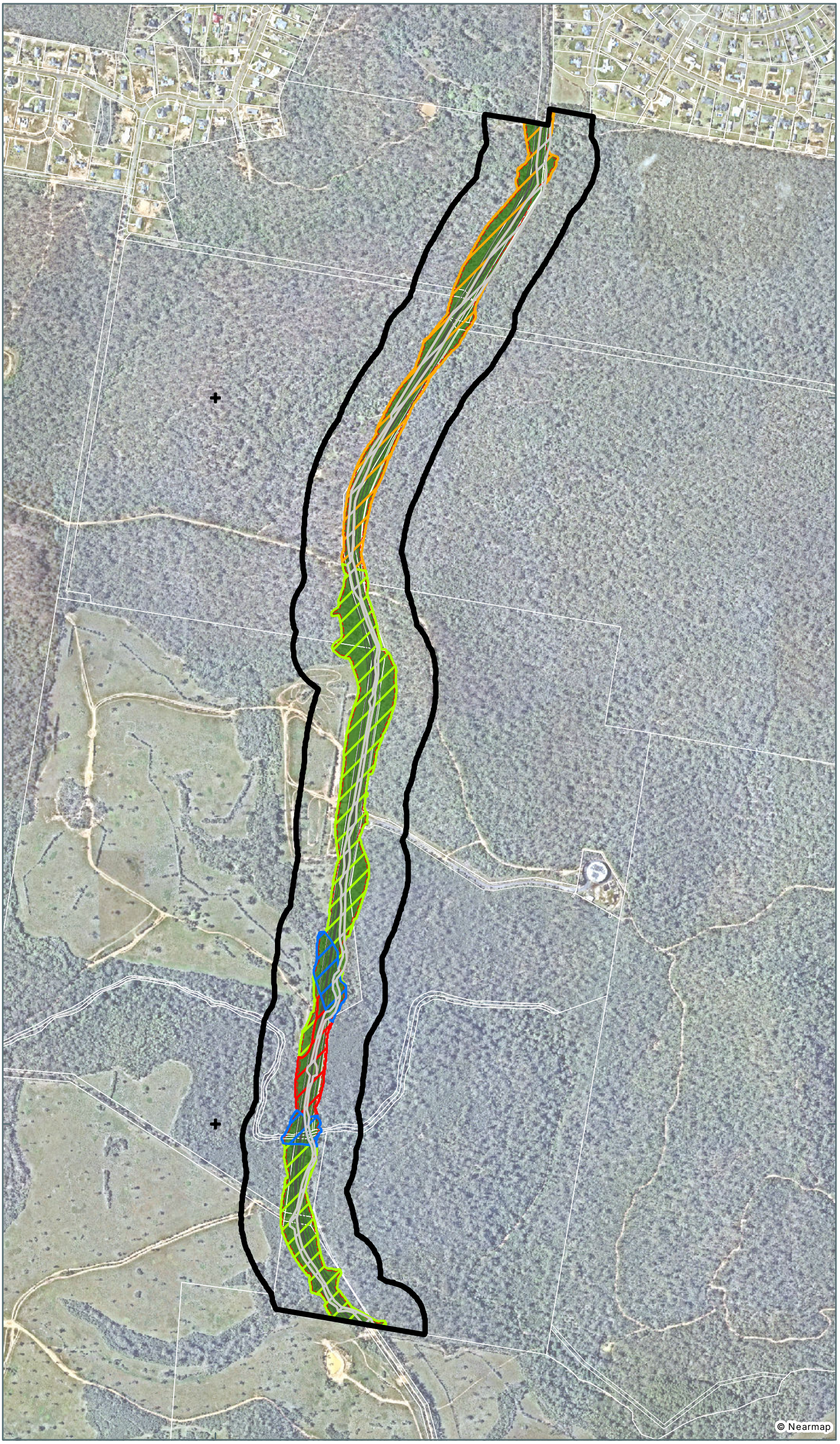
For this project, Site Condition and Site Context were given a weighted score out of three (3), while Species Stocking Rate given a weighted score out of four (4).

Species Stocking Rate was assigned the highest weighting as it is considered the greatest determinant of site suitability for the Koala. Species Stocking Rate is an important component when assessing the overall habitat quality of a site as it indicates species usage.

Site Condition and Site Context were assigned the equal weighting (scored out of 3). The Koala is known to occupy a variety of habitats, ranging from non-remnant regrowth eucalypt forest/woodland through to old growth remnant forest/woodland, however, the site condition of the habitat is considered to directly influence the long-term Koala carrying capacity. Site Context is considered an important component when assessing the Koala as it directly relates to the long-term survival rate of the species. The proximity of the site to other areas of suitable habitat, the movement pattern through the landscape of the Koala (and/or barriers inhibiting movement) and threats to the species are important attributes to assess when considering the overall functionality of the site.

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

A27. CRITICAL KOALA HABITAT IMPACTS



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LEGEND

- Qld DCDB
- Referral Area
- Critical Koala habitat directly impacted [23.3 ha]

Engineering Detail

- Road Design
- Batters

Assessment Units Impacted

- *Assessment Unit 1:* Pre-clear RE 12.9-10.19a [5.9 ha impacted]
- *Assessment Unit 2:* Pre-clear RE 12.9-10.2/12.9-10.7 [10.3 ha impacted]
- *Assessment Unit 3:* Pre-clear RE 12.3.11/12.3.7 [1.2 ha impacted]
- *Assessment Unit 4:* Pre-clear RE 12.9-10.7a [1.5 ha impacted]
- *Assessment Unit 5:* Existing cleared track [4.4 ha impacted]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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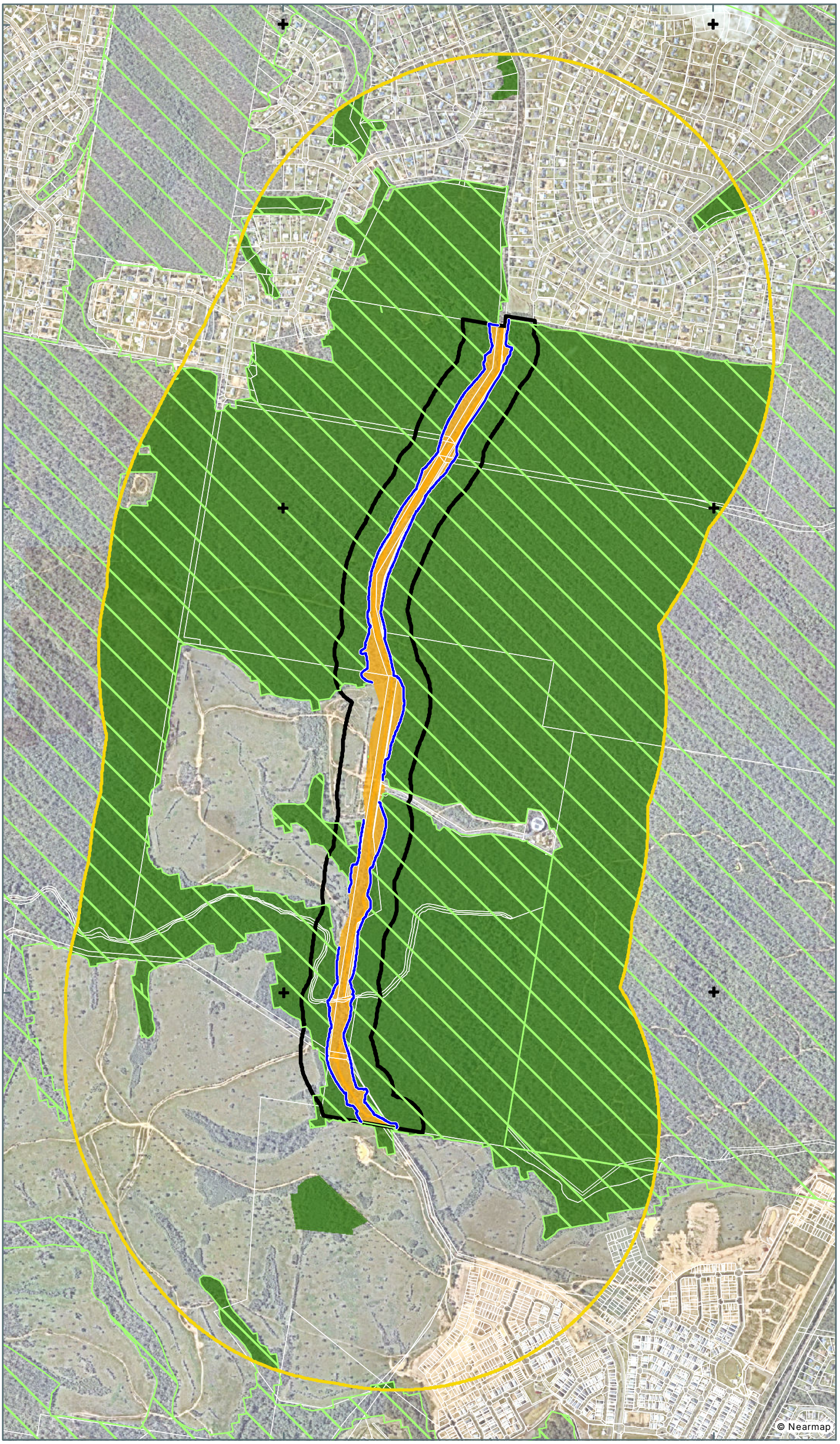
8418 E A27 NBR Impact CKHA B

A28. KOALA CONTEXT ASSESSMENT



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LEGEND

- Qld DCDB
- Referral Area
- Direct Impact
- 1km buffer
- Percentage of direct impact boundary length supporting a connection off and on site to Koala critical habitat - 85%
- Percentage of Koala critical habitat within 1km of direct impact area (58%)
- Size of Koala critical habitat patch > 500 ha

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

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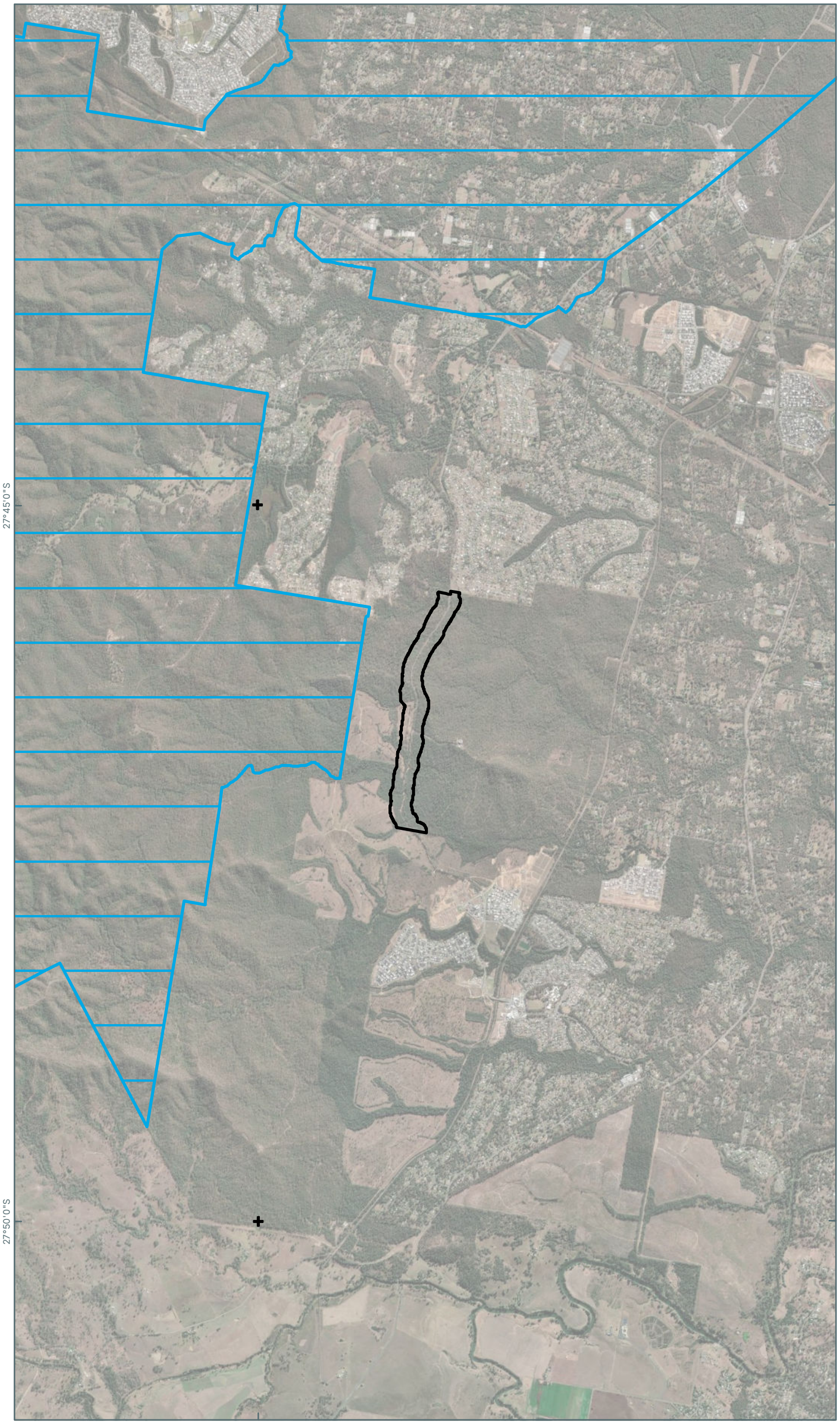
8418 E A28 NBR Koala Context B

A29. ECOLOGICAL CORRIDORS



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LEGEND

- Referral Area
- Regional biodiversity corridor (SEQ Regional Plan 2017)

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

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8418 E A29 NBR Ecological Corridors A

4.4.3. Discussion - Quantum of Impact

A total of eight (8) MHQA transects were conducted across the vegetation communities on-site within four (4) distinct assessment units. These Aus are described as Category X non-remnant vegetation representative of preclear RE12.9-10.19a, remnant RE12.9-10.2, remnant RE12.3.11 and remnant RE12.9-10.7. The averages of the transects were taken to achieve a single site condition score for each assessment unit.

The habitat quality scores for each assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A23** to **Table A33**. 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.

Site Condition (30%)

AU1 (Non-remnant RE12.9-10.19a) achieved an average score for Site Condition of **1.76** out of 3. AU2 (Remnant RE12.9-10.2) achieved an average score for Site Condition of **2.27** out of 3. AU3 (Remnant RE12.3.11) achieved an average score for Site Condition of **1.61** out of 3. AU4 (Remnant RE12.9-10.7) achieved an average score for Site Condition of **1.88** out of 3. AU5 scored **0** out of 3 for Site Condition.

The transects generally scored poorly for large trees per ha, coarse woody debris, and non-native plant cover and scored moderately for species richness of shrubs, grasses and forbs. Refer to **Appendix A10** for raw MHQA data and photos facing north, south, east and west captured at the 50 m transect mark for each transect. Given the generally poor site condition scoring and inherent overestimate of score as the existing road was avoided in transects, quality and availability of food and foraging and shelter habitat were conservatively scored moderate, or 5 /10, for each assessment unit.

Site Context (30%)

The results of the Koala context assessment are present in **Plan A28**. The patch size was determined to be > 500 hectares. The percentage of boundary length of the impact was calculated at 85% and the percentage of habitat critical to the survival of the Koala within 1 km of the impact site is 58%.

Size of patch

This attribute is a measure of the size of the patch of vegetation in which the assessment unit is located. The scoring reflects the importance of large patches in the landscape and is based on the size of the patch of critical Koala habitat connected to the site in this instance. This attribute is scored such that is reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS, and achieved a score of 10 out of 10 as the site of critical Koala habitat patch was calculated to be >500 ha (greater than 200 ha as per the *Queensland BioCondition Assessment* methodology (**Plan A28**).

While bushland on-site is presently connected to remnant vegetation east and west, the lots to the east currently undergoing EPBC Act determinations (EPBC 2019/8412 and EPBC 2019/8398) (**Plan A3**). Some

inconsistent pockets of remnant vegetation occurs in the south, however these have all received determination (EPBC 2014/72.06 and EPBC 2015/7530). Following the commencement of clearing of these lots to the south, and east the site will be further fragmented from potential habitat and lose most connectivity that presently exists on site. Remaining linkages will be limited through the northern extend of site only, with the site adjacent to development on all other sides (**Plan A3**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected with 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 project area boundary length supporting a Koala critical habitat connection off and on-site was calculated at 85%, and consequently this attribute scored a 5 out of 5 (**Plan A28**).

Context

The context attribute refers to the amount of critical Koala habitat that is retained within a 1 km buffer of the site being assessed and is calculated using GIS. Retained critical Koala habitat within a 1 km buffer of the site was calculated at 58%, and therefore the context attribute achieved a score of 4 out of 5 (**Plan A28**).

Ecological Corridors

GIS mapping was utilised to identify the site's role in any ecological corridors on or adjacent to the site (refer **Plan A29**). The site does not form part of any mapped ecological corridors. Therefore, this attribute was scored 0 out of 6.

Role of site location to species overall population in the state

This attribute aims to quantify the geographical importance of the site for Koala populations across the broader state. This attribute achieved a score of 5 out of 5 given the site contains habitat critical to the survival of the Koala.

Threats to the species

The threats to the species attribute aims to quantify the risk to survival of the Koala on-site. Key known threats to the survival of the Koala include the existing road and tracks due to the risk of motor vehicle strike (refer e.g. Queensland Habitat Quality Assessment Guideline 1.2), as well as predation by wild or domestic dogs. Notably, two Koala skulls were recorded within the assessment area, with one next to a splayed carcass indicative of dog attack.

The risk of motor vehicle strike to Koalas on or adjoining the site would be relatively high as the site is an existing road and track that is frequented by 4WD vehicles and provide access to the adjoining water tower, with residences and roads within the surrounding landscape. A review of the Koala Hospital Records show that two (2) Koala deaths have occurred nearby the site. Both are located towards the east of the site with one (1) is located approximately 1.3 km east and the other approximately 4.2 km east in association with Teviot Road (refer **Plan A30**).

It is noted that anticipated growth and planned residential development throughout Greater Flagstone will result in increased traffic flows. Multiple Koala deaths are noted in the surrounding landscape in association with major roads. Threats to Koala are anticipated to increase as a result of the development.

In addition, evidence of dogs utilising the site were recorded during initial field survey for the EPBC referral (refer **Part B MNES Report**). Due to the situation of the site abutting extensive residential estates in the north, and with modified bushland and cleared areas to the west associated with agricultural uses, access to the site by wild dogs or those off-leash is considered an increased risk to Koala mortality.

Table A22 provides a risk matrix relative to the conservation advice for the Koala to determine threats to species. Essentially, each of the threats identified within the conservation advice is weighted relative to the identified level of risk, with the weighted scores summed to provide the threat score, noting the MHQA allows for only scores of 1 (high), 7 (moderate) or 15 (low) for threats.

Table A22: Koala Threat Thresholds and Scoring

Metric	Low	Moderate	High
Threat Thresholds			
Clearing and Degradation of Habitat	Apply one of the following options in order of priority: 1. Apply a current legal protective mechanism. 2. The site is zoned for conservation purposes or clearing is not permitted. 3. If ≤30% of the area within a 5 km buffer of the site is cleared or disturbed land.	In the absence of justification for scoring as high or low and if: >30% and <70% of the area within a 5km buffer of the site is cleared or disturbed land.	Apply one of the following options in order of priority: 1. The site is zoned for development 2. If ≥ 70% of the area within a 5 km buffer of the site is cleared or disturbed land.
Score Weighting	**6**	**2.8**	**0.4**
Inappropriate Fire Regimes **Very High Risk**	Current Government endorsed Bushfire Management Plan (BMP) to protect the Koala is in effect.	Non-Koala specific BMP in effect. or; Low fuel load and low fire risk.	Site has a high fuel load and/or high fire risk.
Score Weighting	**6**	**2.8**	**0.4**

Metric	Low	Moderate	High
Vehicle Strike Moderate Risk	Low volume of cars, unsealed, no Koala accessibility, fencing, and mitigation measures in place, negligible Koala mortality.	Site-specific and evidence-based qualitative assessment of these considerations	High volume of cars, sealed, accessibility for Koala, no fencing, and no mitigation measures in place, high Koala mortality
Score Weighting	**1.5**	**0.7**	**0.1**
Dog Attack Moderate Risk	No dogs recorded on site.	Dogs recorded on site and adequate refuge for Koalas (>70% canopy cover).	Dogs recorded on site and limited refuge for Koalas (<70% canopy cover)
Score Weighting	**1.5**	**0.7**	**0.1**
Threats to Species			
Threshold Analysis	≥10	>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)

The site is considered to have a high fuel load being unmanaged remnant and regrowth vegetation and multiple burnt out cars are present, including one dumped and set alight while field work was being undertaken. The site scores high for inappropriate fire regimes.

Due to the presence of several hospital records in the local area with one recent record directly adjacent to the site, absence of protection fencing and mitigation measures and the presence of an existing road, the attribute 'vehicle strike'' were scored moderate.

Analysis against the risk matrix suggests that the site scores 2.2, or a 1 out of a possible 15 for threats (**Table A22**).

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 in order to meet its needs for survival. 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 highways or residential developments. Conversely, the Koala is considered a relatively immobile species due to its slow-moving nature and vulnerability to threats on ground as outlined above.

In this instance, the species mobility capacity for the Koala on-site was assigned the high score of 10 out of 10 due to the absence of barriers. It is noteworthy that, while bushland on-site is presently connected to bushland east and west of the site, two (2) EPBC Act determinations exist across the bushland adjoining the site to the east and west. In addition, residential developments disconnect the site to the north, and the future Flagstone City adjoins the site to the south. Following the commencement of clearing of these lots to the east and west, the site will be disconnected from surrounding bushland for relatively immobile species such as the Koala, with the exception of the remaining connectivity along Flagstone Creek.

Species Stocking Rate (40%)

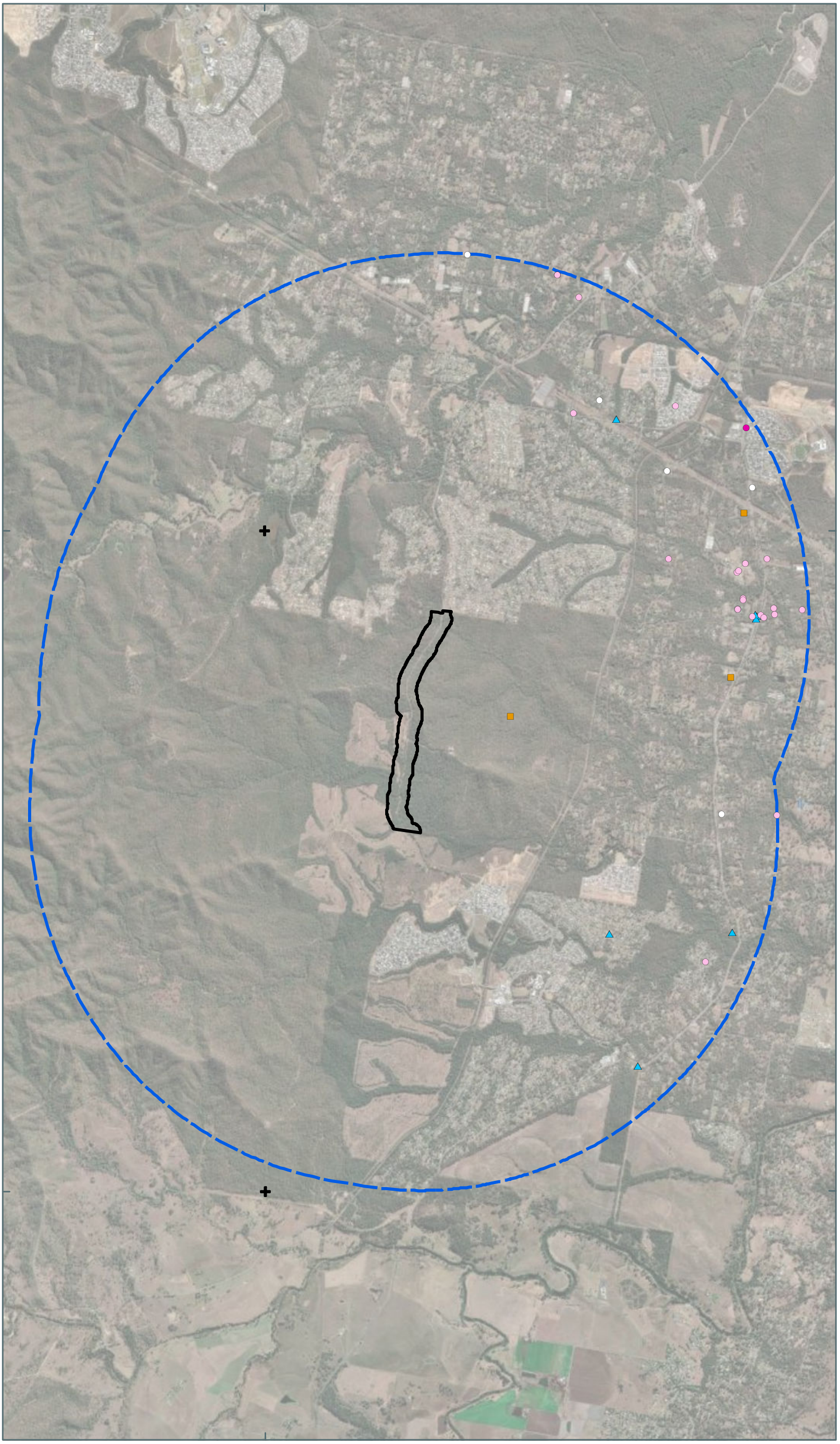
The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Koala carrying capacity of each assessment unit at the time of undertaking the survey. A species stocking rate score of 40 out of 70 was attributed to AU1 to AU4. This was largely attributed to the fact that evidence of Koala indicated low usage, where usage indicates breeding and the SEQ population is considered a population for dispersal. AU5 scored 20 out of 70 as it is an existing cleared track and included as dispersal habitat only. The complete calculations for species stocking rate are found in **Appendix A13.**

Results of Koala specific SAT surveys note that a total of eight (8) SAT surveys were completed across the impact site by SHG (**Plan A23**). The SAT results indicate that there were only low to no levels of Koala activity.

Summary

To summarise, the action is considered to impact on moderate quality Koala habitat, having a total impact of **5.59 out of 10** (refer **Table A33**). The vegetation on the site is part of a contiguous landscape of habitat by existing barriers and threats with future development scheduled for the adjoining eastern and western land parcels. Substantial management and mitigation measures are considered to result in a manageable impact on Koala habitat in the context of the Flagstone Area. It is considered that any potential impacts on any transient Koalas during clearing and operation can be appropriately managed through the proposed mitigation and management measures.

A30. KOALA HOSPITAL INCIDENT LOCATIONS



Notes:

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

Layer Sources

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

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Updated data available at

http://qldspatial.information.qld.gov.au/catalogue/

* Reproduction of this plan or any part of it without this note being included in full will render the information shown on such reproduction invalid and not suitable for use.

LEGEND

- Referral Area
- 5km Referral Area Buffer

QId Koala hospital records

- Deceased
- Injured
- Sick and/or wasted
- Sick & Injured
- Orphaned
- Other incident type/ category not recorded

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 1 2 km

1:55,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

Saunders Havill
BOWENHILLS | SPRINGFIELD
1300 123 744 | mail@saundershavill.com

PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

15/10/2025

8418 E A30 NBR Koala Hospital A

Table A23: MHQA Results – Assessment Unit 1

Assessment Unit - Regional Ecosystem	AU 1 - Cat X - cleared with scattered regrowth (Preclear RE12.9-10.19a)					
	RE12.9-10.19a Benchmark	Transect 2	Transect 3	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	4	10	11	10.5	262.50	5
Native plant species richness - shrubs	6	1	3	2	33.33	2.5
Native plant species richness - grasses	7	6	5	5.5	78.57	2.5
Native plant species richness - forbs	14	7	12	9.5	67.86	2.5
Tree canopy height (Canopy)*	24	22	21	21.5	89.58	5
Tree canopy height (Sub-canopy)*	10	15	16	15.5	155.00	5
					*Average tree canopy height	5.0
Tree canopy cover (Canopy)**	59	95.4	53.1	74.25	125.85	5
Tree canopy cover (Sub-canopy)**	22	58.1	71.2	64.65	293.86	3
					**Average tree canopy cover	4.0
Shrub canopy cover	11	16.9	0.7	8.8	80.00	5
Native grass cover*	16	15	27	21	131.25	5
Organic litter*	53	67	48	57.5	108.49	5
Large trees (euc plus non-euc) (per ha)	24	0	0	0	0.00	0
Coarse woody debris (per ha)	285	136	70	103	36.14	2
Non-native plant cover	0	20	20	20	20	5
Quality and availability of food and foraging habitat	NA	5	5	5	-	5
Quality and availability of shelter	NA	5	5	5	-	5
					Site Condition Score (/100)	58.5
					Overall Site Condition Score - out of 3	1.76
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	5	5	5		**5**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	1	1	1		**1**
Species mobility capacity	**10**	10	10	10		**10**
					Site Context Score (/56)	**35**
					Overall Site Context Score - out of 3	**1.88**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	**40**	**40**	**40**		
					Species Stocking Rate Score (/70)	**40**
					Overall Species Stocking Rate Score - out of 4	**2.29**
					Overall Assessment Unit Score	**5.92**

Table A24: Species Stocking Rate Results AU1

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**40/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A25: MHQA Results – Assessment Unit 2

Assessment Unit - Regional Ecosystem	AU 2 - Cat B - highly disturbed mapped remnant veg with scattered mature Eucalypt species (RE12.9-10.2)					
	RE12.9-10.2 Benchmark	Transect 1	Transect 8	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	50	75	75	3
Native plant species richness - trees	**6**	5	7	6	100.00	5
Native plant species richness - shrubs	**7**	5	5	5	71.43	2.5
Native plant species richness - grasses	**7**	6	5	5.5	78.57	2.5
Native plant species richness - forbs	**13**	9	13	11	84.62	2.5
Tree canopy height (Canopy)*	**21**	21	17	19	90.48	5
Tree canopy height (Sub-canopy)*	**12**	12	12	12	100.00	5
					***Average tree canopy height**	**5.0**
Tree canopy cover (Canopy)**	**64**	77.3	44.6	60.95	95.23	5
Tree canopy cover (Sub-canopy)**	**20**	50.9	67.3	59.1	295.50	3
					****Average tree canopy cover**	**4.0**
Shrub canopy cover	**6**	1.1	18.6	9.85	164.17	**5**
Native grass cover*	**21**	6	2	4	19.05	1
Organic litter*	**48**	51	55	53	110.42	5
Large trees (euc plus non-euc) (per ha)	**38**	38	4	21	55.26	10
Coarse woody debris (per ha)	**506**	446	92	269	53.16	5
Non-native plant cover	**0**	35	10	22.5	22.5	5
Quality and availability of food and foraging habitat	**NA**	10	10	10	-	10
Quality and availability of shelter	**NA**	10	10	10	-	10
					Site Condition Score (/100)	75.5
					Overall Site Condition Score - out of 3	2.27
SITE CONTEXT						

Size of patch	**10**	10	10	10		**10**
Connectedness	**5**	5	5	5		**5**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	1	1	1		**1**
Species mobility capacity	**10**	10	10	10		**10**
					Site Context Score (/56)	**35**
					Overall Site Context Score - out of 3	**1.88**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	**40**	**40**	**40**		
					Species Stocking Rate Score (/70)	**40**
					Overall Species Stocking Rate Score - out of 4	**2.29**
					Overall Assessment Unit Score	**5.91**

Table A26: Species Stocking Rate Results AU2

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**40/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A27: MHQA Results – Assessment Unit 3

Assessment Unit - Regional Ecosystem	AU 3 - Cat B - Remnant vegetation associated with Flagstone Creek (RE12.3.11/12.3.7)					
	RE12.3.11 Benchmark	Transect 4	Transect 7	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	0	50	50	3
Native plant species richness - trees	7	4	8	6	85.71	2.5
Native plant species richness - shrubs	7	3	4	3.5	50.00	2.5
Native plant species richness - grasses	12	2	2	2	16.67	0
Native plant species richness - forbs	25	6	11	8.5	34.00	2.5
Tree canopy height (Canopy)*	23	23	19	21	91.30	5
Tree canopy height (Sub-canopy)*	8	8	14	11	137.50	5
					*Average tree canopy height	5.0
Tree canopy cover (Canopy)**	56	63.7	28.2	45.95	82.05	5
Tree canopy cover (Sub-canopy)**	33	52.3	79.5	65.9	199.70	5
					**Average tree canopy cover	5.0
Shrub canopy cover	20	21.4	16.5	18.95	94.75	5
Native grass cover*	44	8	67	37.5	85.23	3
Organic litter*	37	57	6	31.5	85.14	5
Large trees (euc plus non-euc) (per ha)	30	14	8	11	36.67	5
Coarse woody debris (per ha)	555	289	178	233.5	42.07	2
Non-native plant cover	0	30	25	27.5	27.5	3
Quality and availability of food and foraging habitat	NA	5	5	5	-	5
Quality and availability of shelter	NA	5	5	5	-	5
					Site Condition Score (/100)	53.5
					Overall Site Condition Score - out of 3	1.61
SITE CONTEXT						

Size of patch	**10**	10	10	10		**10**
Connectedness	**5**	5	5	5		**5**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	1	1	1		**1**
Species mobility capacity	**10**	10	10	10		**10**
					Site Context Score (/56)	**35**
					Overall Site Context Score - out of 3	**1.88**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	40	40	40		
					Species Stocking Rate Score (/70)	**40**
					Overall Species Stocking Rate Score - out of 4	**2.29**
					Overall Assessment Unit Score	**5.77**

Table A28: Species Stocking Rate Results AU 3

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**40/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A29: MHQA Results – Assessment Unit 4

Assessment Unit - Regional Ecosystem	AU 4 - Cat B - Eucalypt dominated remnant veg. (RE12.9-10.7)					
	RE12.9-10.7 Benchmark	Transect 1	Transect 2	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	3	4	8	6	200.00	5
Native plant species richness - shrubs	5	3	6	4.5	90.00	2.5
Native plant species richness - grasses	8	3	4	3.5	43.75	2.5
Native plant species richness - forbs	26	6	10	8	30.77	2.5
Tree canopy height (Canopy)*	21	16	17	16.5	78.57	5
Tree canopy height (Sub-canopy)*	10	8	5	6.5	65.00	3
					*Average tree canopy height	4.0
Tree canopy cover (Canopy)**	40	18.6	51.9	35.25	88.13	5
Tree canopy cover (Sub-canopy)**	8	78.9	89.8	84.35	1054.38	3
					**Average tree canopy cover	4.0
Shrub canopy cover	3	12.2	1.3	6.75	225.00	3
Native grass cover*	61	2	35	18.5	30.33	1
Organic litter*	20	91	36	63.5	317.50	3
Large trees (euc plus non-euc) (per ha)	18	18	10	14	77.78	10
Coarse woody debris (per ha)	272	604	232	418	153.68	5
Non-native plant cover	0	5	10	7.5	7.5	5
Quality and availability of food and foraging habitat	NA	5	5	5	-	5
Quality and availability of shelter	NA	5	5	5	-	5
					Site Condition Score (/100)	62.5
					Overall Site Condition Score - out of 3	1.88
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	5	5	5		**5**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	1	1	1		**1**
Species mobility capacity	**10**	10	10	10		**10**
					Site Context Score (/56)	**35**
					Overall Site Context Score - out of 3	**1.88**
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	**40**	**40**	**40**		
					Species Stocking Rate Score (/70)	**40**
					Overall Species Stocking Rate Score - out of 4	**2.29**
					Overall Assessment Unit Score	**6.04**

Table A30: Species Stocking Rate Results AU4

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	10/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**40/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A31: MHQA Results – Assessment Unit 5

Assessment Unit - Regional Ecosystem	AU5 - Track
	Score
SITE CONDITION	
Recruitment of woody perennial species in EDL	0
Native plant species richness - trees	0
Native plant species richness - shrubs	0
Native plant species richness - grasses	0
Native plant species richness - forbs	0
Tree canopy height (Canopy)*	0
Tree canopy height (Sub-canopy)*	0
*Average tree canopy height	0
Tree canopy cover (Canopy)**	0
Tree canopy cover (Sub-canopy)**	0
**Average tree canopy cover	0
Shrub canopy cover	0
Native grass cover*	0
Organic litter*	0
Large trees (euc plus non-euc) (per ha)	0
Coarse woody debris (per ha)	0
Non-native plant cover	0
Quality and availability of food and foraging habitat	0
Quality and availability of shelter	0
Site Condition Score (/100)	0
Overall Site Condition Score - out of 3	0.00
SITE CONTEXT	
Size of patch	10
Connectedness	5

Context	**4**
Ecological Corridors	**0**
Role of site location to species overall population in the state	**5**
Threats to the species	**1**
Species mobility capacity	**10**
Site Context Score (/56)	**35**
Overall Site Context Score - out of 3	**1.88**
SPECIES STOCKING RATE	
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**20**
Species Stocking Rate Score (/70)	**20.00**
Overall Species Stocking Rate Score - out of 4	**1.14**
Overall Assessment Unit Score	**3.02**

Table A32: Species Stocking Rate Results AU5

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10
Species usage of the site (habitat type and evidenced usage)	5/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**20/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A33: MHQA Final Weighting Score

MHQA Final Weighting	AU 1	AU 2	AU 3	AU 4	AU5
Site Condition (/3)	1.76	2.27	1.61	1.88	0.00
Site Context (/3)	1.88	1.88	1.88	1.88	1.88
Species Stocking Rate (/4)	2.29	2.29	2.29	2.29	1.14
Assessment Unit Area (Impact) (ha)	5.90	10.30	1.20	1.50	4.40
Total Impact Area (ha)	23.30	23.30	23.30	23.30	23.30
Size Weighting	0.25	0.442	0.05	0.06	0.19
AU Weighted Score	1.50	2.84	0.30	0.39	0.57
Total Weighted Score	**5.59**				

4.5.Additional Species

4.5.1. Grey-headed Flying Fox (*Pteropus poliocephalus*)

Assessment against the Significant Impact Guidelines 1.1 for the Grey-headed Flying Fox

The Significant Impact Guidelines 1.1 provides specific definitions for '*a population of a species*' and '*habitat critical to the survival of a species or ecological community*'. This definition is a key consideration when conducting significant impact assessments for a threatened species or ecological community listed under the EPBC Act. The definitions are presented below.

To determine whether the proposed action is likely to have a significant impact on the Grey-headed Flying Fox, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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

   Assessment: Although some flowering Eucalypt species were observed within the referral area, no evidence of Grey-headed Flying-fox individuals were recorded and no roost camps were recorded on site during field survey. No known roost camps are located within close proximity to the site with the nearest roost located approximately 5 km south-east of the site at Homestead Drive (464), with the latest survey in August of 2013 categorising the number of GHFF at a level 1 which equates to between 1-499 individuals (**Plan A8**).

   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. While vegetation on site may be considered potential foraging habitat for the species, due to the absence of roost camps on or within close proximity to the site and the abundance of suitable habitat to the west, the site is considered part of a broader home range for transient individuals and to not support an important population of the species. The proposed action is unlikely to lead to a long term decrease in the size of any local Grey-headed Flying-fox populations.

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

   Assessment: Although some flowering Eucalypt species were observed within the referral area, no evidence of Grey-headed Flying-fox individuals were recorded and no roost camps were recorded on site during field survey. No known roost camps are located within close proximity to the site with the nearest roost located approximately 5 km south-east of the site at Homestead Drive (464), categorising the number of GHFF at a level 1 which equates to between 1-499 individuals. As such, the project will not have a significant impact on any population of the species. Roosting camps are located within approximately 5 - 11 km of the site, however, the given the abundance of suitable habitat to the west in comparison to the relative quality of site habitat, the site is only considered to be utilised by transient individuals as part of a broader home range. While the proposed action will remove potential foraging habitat, given the abundant availability of eucalypts in the surrounding

landscape and the greater SEQ region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.

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

   Assessment: The SPRAT species profile outlines that while there are spatially structured colonies of Grey-headed Flying-fox, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the species' geographic range. In addition, the impacted vegetation is relatively narrow linear strip between inconsistent vegetation patches. Therefore, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.

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

   Assessment: While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed and subject to edge effects from surrounding existing and planned future urban development. Historically GHFF habitat is thought to be synonymous with Koala habitat, analysis of impacts revealed only a lineal strip of 18.9 ha of GHFF habitat is proposed to be directly impacted as part of the action (**Plan A31**). Further, this habitat is not considered to be unique or of special value. The SEQ landscape provides abundant eucalypt and similar genera which are available for foraging. The linear nature of the road is not considered a significant impact on the available canopy for foraging relative to that available in the landscape. Notably, *Eucalyptus tereticornis, E. crebra, Melaleuca quinquenervia*, and *Corymbia citriodora* are identified in the recovery plan as important winter and spring vegetation communities, and where the existence of these important winter and spring flowering vegetation communities is verified in the field, they are considered habitat critical to the survival of the Grey-headed Flying-fox. This suggests that the site which supports these foraging species maintains habitat critical to the survival of the GHFF. As such, there is likely to be a significant impact to the GHFF as a result of the action.

5. **Disrupt the breeding cycle of an important population.**

   Assessment: The site surveys did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, where they carry their young to feeding sites for four to five weeks after giving birth. As no roosting camps were observed on or near the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.

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: Historically GHFF habitat has thought to be synonymous with Koala habitat, analysis of impacts revealed only 18.9 ha of GHFF habitat in a linear strip is proposed to be directly impacted as part of the action (**Plan A31**). Further, this habitat is not considered to be unique or of special value. Its removal is unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of eucalypts in the surrounding area. More contiguous higher value foraging habitat is located to the west of the site. Further the narrow impact area which is partially composed of a previously cleared area is unlikely to limit the movement of species.

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 exacerbate the introduction of invasive species.

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: Recovery of the species has specifically targeted the broad scale culling of the species. In addition, conservation efforts have led to the protection of known roosting sites and important habitat. The site has not been identified as an important habitat or roost site and the action is unlikely to interfere with the recovery of the species.

Summary

Although a significant impact is not considered likely, potential foraging habitat for the Grey-headed Flying-fox will be cleared under the proposal. Therefore an impact assessment has been completed.

Grey-headed Flying-fox Impact Assessment

The proposal results in the clearing of 18.9 ha of vegetation that is identified as providing potential foraging habitat for the Grey-headed Flying-fox (refer **Plan A31**). The impact site has been 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.

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

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

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

Site Condition (40%)

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

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

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

Assessment methodology of the above condition characteristics is outlined below:

- *Vegetation condition* – This condition characteristic is assessed using the Queensland *Vegetation Management Act 1999* vegetation community status definition, being Category B (remnant), Category C (high-value regrowth) and Category X (non-remnant). This characteristic is scored from a desktop mapping perspective and verified on-ground during assessment. Refer to **Table A34** for the benchmark scoring values for this condition characteristic.

- *Species richness (canopy trees)* – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. Within the plot, all canopy tree and subcanopy tree specimens are recorded. The species richness of canopy trees is the average number of GHFF foraging for the assessment unit (which includes species from the genus *Eucalyptus*, *Corymbia*, *Angophora*, *Melaleuca* and *Syncarpia*). The number or species recorded per transect within the assessment unit is divided by the number of transects to produce an average number of GHFF foraging species. Please note that non-GHFF foraging species are also documented. Refer to **Table A35** for the benchmark scoring values for this condition characteristic.

- *Flower scores (average)* – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature on nectar productivity of foraging species, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017). Flower scores of foraging species are derived from Table 4.1 of Eby and Law (2008) which calculates the flower score as:
    - Wt p* r = $(\text{productivity})^{0.7} * (\text{reliability})^{0.3}$
- Productivity is based on abundance and spatial synchrony and reliability is based on the consistency with which a species flowers from year to year. *Eucalyptus moluccana* was provided a flower score range of 0.35 to 0.65. The flower score of this species was determined as the average value of the range (w p*r = 0.5). The flower scores for each transect are then summed and divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The

benchmark values for this condition characteristic has been derived from the findings published by Eby and Law (2008) (*Ranking the feeding habitat of Grey-headed flying foxes for conservation management*). Refer to **Table A36** for the benchmark scoring values for this condition characteristic.

- *Timing of biological shortages* – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017) and determining the ability of the canopy species in the vegetation community to produce foraging habitat during biological shortages (food shortages, pregnancy and birthing, lactation, mating and conception, migration paths and fruit industries). Each biological shortage is assigned a bi-monthly period. Bi-monthly flowering phenologies for GHFF foraging species are derived from Table 4.5 of Eby and Law (2008). Winter food resources is considered a limiting factor for GHFFs in South East Queensland (Eby and Law 2008), therefore, winter foraging species such as *E. crebra*, *E. siderophloia* and *C. citriodora* are generally weighted with a higher flower score than other species. Each biological shortage within this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue. Species recorded within transects of each AU are then compared to the bi-monthly flowering phenology and provision of biological shortage and scored against the values in **Table A37**.
- *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). Please note that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given its importance as a winter flowering species as acknowledged in the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE 2017). Refer to **Table A38** for the benchmark scoring values for this condition characteristic.
- *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. Refer to **Table A39** for the benchmark scoring values for this condition characteristic.

Please note 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.

Site Context (30%)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and State

mapped ecological corridors. Under the GHFF FHA, site context is measured using the following six characteristics:

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

Assessment methodology of the above context characteristics is outlined below:

- *Size of patch* – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the directly connected patch of GHFF foraging habitat to site measured. This context characteristic is measured using GIS. Refer to **Table A40** for the benchmark scoring values for this context characteristic.
- *Connectedness* – This context characteristic is assessed by counting the number of active GHFF roosts within a 20 km radius of the site (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). Refer to **Table A41** for the benchmark scoring values for this context characteristic.
- *Context* – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the percentage of GHFF foraging habitat within a 20 km buffer of the site measured. This context characteristic is measured using GIS. Refer to **Table A42** or the benchmark scoring values for this context characteristic.
- *State Mapped Ecological corridors* – This context characteristic is assessed using the traditional habitat quality assessment methodology which involves determining the proximity of the site to state, bioregional, regional or sub-regional corridors. Refer to **Table A43** for the benchmark scoring values for this context characteristic.
- *Threats to species* – This context characteristic is assessed by analysing the published scientific literature regarding threats to GHFF and determining the number and severity of the threatening processes observed at or adjacent to the site. Known threatening processes to the GHFF are detailed in the *National Recovery Plan for the Grey-headed Flying-fox 'Pteropus poliocephalus'* (DAWE, 2021). The key threat to GHFF is habitat loss with other threats including camp disturbance, mortality in commercial fruit crops, heat stress, entanglement in netting and barbed wire fencing, climate change, bushfires, electrocution on power lines and public misunderstanding of disease risk. This attribute considers processes occurring on-site that may threaten the species rather than broad processes such as climate change and bushfires. A high level of threat is considered any activity that is currently modifying the habitat on-site or is disturbing an on-site roost. A moderate level of threat is considered

any interaction that may be harming or interfering with a GHFF individual such as net entanglement. A low level of threat is the absence of processes that may actively threaten GHFF or a low likelihood that a GHFF may be negatively impacted through interacting with the site. Refer to **Table A44** for the benchmark scoring values for this context characteristic.

- *Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius)* – This context characteristic is assessed by considering the number of active GHFF roost camps level 3 or greater (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). Refer to **Table A45** for the benchmark scoring values for this context characteristic.

Species Stocking Rate (30%)

The GHFF FHA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. As discussed above, species stocking rate for GHFF associated with this proposed action is related to the density of GHFF foraging habitat at the site at the time of undertaking the survey. The stem density is calculated as the number of foraging tree species stems per hectare.

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

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot (0.2 ha) that are classed as foraging species for GHFF. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. The stem density of canopy species recorded within the 0.2 ha plot is multiplied by five (5) to determine the number of stems per hectare or stem density. This number is then compared to the benchmark stem density per ha.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan 2019) and the stem density per hectare associated with the technical description of the regional ecosystems. 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 340 per ha for RE12.9-10.19, 240 per ha for RE12.9-10.2, 846 for RE12.3.11 and 480 per ha for RE12.9-10.7 Refer to **Table A46** Table A46for scoring values for species stocking rate based on the benchmark stem density per hectare.

Table A34: GHFF FHA Vegetation Condition Scoring

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

Table A35: GHFF FHA Canopy Species Richness Scoring

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

Table A36: GHFF FHA Flower Score (average) Scoring

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

Table A37: GHFF FHA Timing of Biological Shortages Scoring

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

Table A38: GHFF FHA Quality of Foraging Habitat (trees >0.65 wt p*r) Scoring

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

Table A39: GHFF FHA Non-Native Plant Cover Scoring

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

Table A40: GHFF FHA Size of Patch Scoring

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

Table A41: GHFF FHA Connectedness Scoring

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

Table A42: GHFF FHA Context Scoring

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

Table A43: GHFF FHA State Mapped Ecological Corridors Scoring

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

Table A44: Threats to species (GHFF) scoring

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

Table A45: Role of site location to GHFF overall population in the State scoring

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

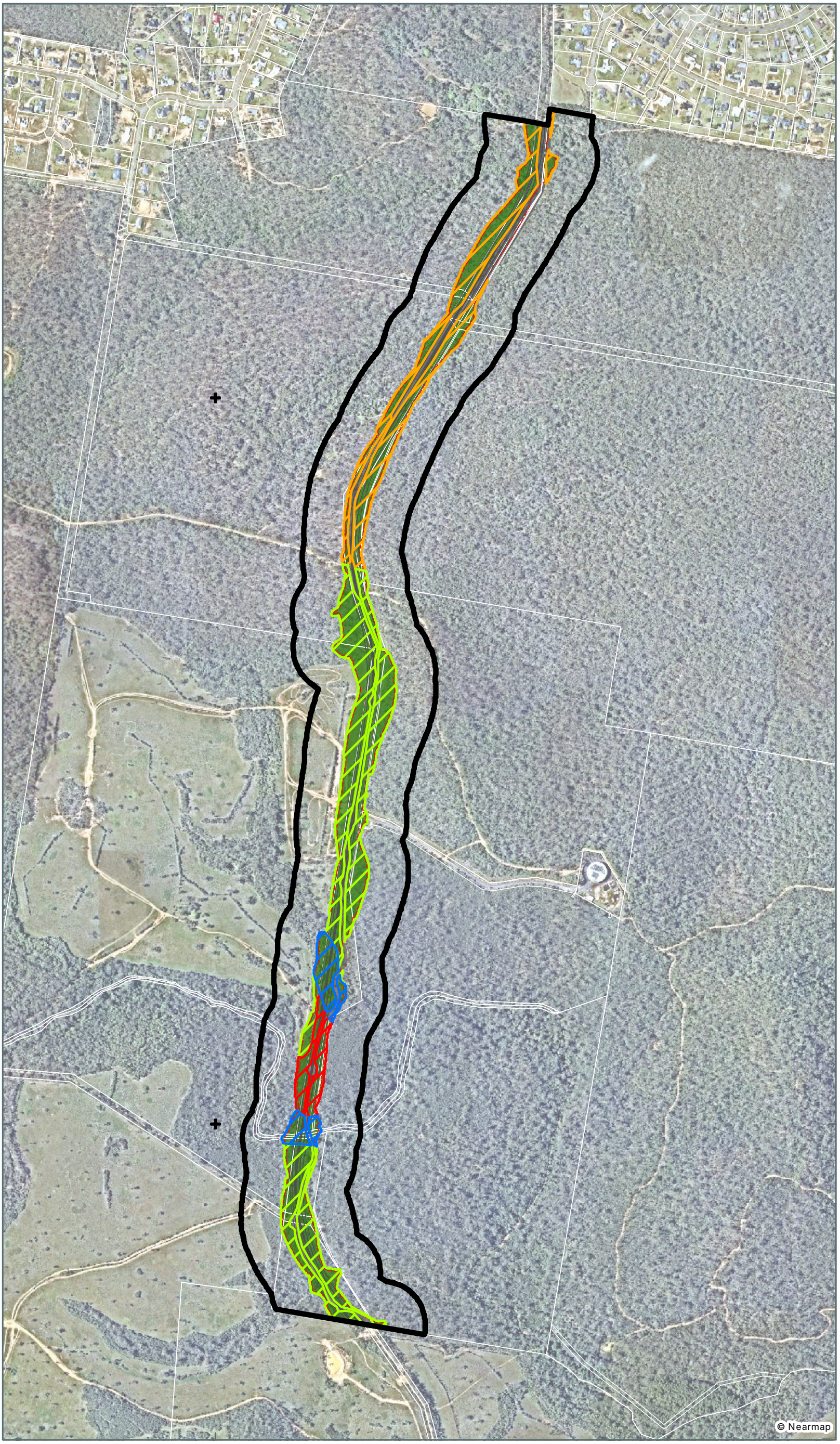
Table A46: GHFF Species Stocking Rate Scoring

Score	RE12.9-10.19	RE.12.9-10.2	RE12.3.11	RE12.9-10.7
2	0-43	0-30	0-106	0-60
4	44-184	31-130	107-458	61-260
6	185-312	131-220	459-776	261-440
8	313-333	221-235	777-828	441-470
10	334-347	236-245	829-864	471-490
8	348-368	246-260	865-916	491-520
6	369-496	261-350	917-1234	521-700
4	497-638	351-450	1235-1586	701-900
2	>638	>450	>1586	>900

Discussion – Quantum of Impact

Results of the GHFF FHA using methodology are shown in **Table A47**. The impact site attained a score of **6 out of 10** (5.52 rounded to 6, refer to **Plan A8** for the Grey-headed Flying-fox Foraging Habitat Plan).

A31. GREY-HEADED FLYING FOX IMPACTS



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

Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
© State of Queensland (Department of Resources) 2025.
Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- Qld DCDB
- Referral Area
- Existing cleared track
- Grey-headed Flying Fox foraging habitat directly impacted [18.9 ha]

Engineering Detail

- Road Design
- Batters

Assessment Units Impacted

- *Assessment Unit 1:* Pre-clear RE 12.9-10.19a [5.9 ha impacted]
- *Assessment Unit 2:* Pre-clear RE 12.9-10.2/12.9-10.7 [10.3 ha impacted]
- *Assessment Unit 3:* Pre-clear RE 12.3.11/12.3.7 [1.2 ha impacted]
- *Assessment Unit 4:* Pre-clear RE 12.9-10.7a [1.5 ha impacted]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

Saunders Havill
BOWENHILLS | SPRINGFIELD
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PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

15/10/2025

8418 E A31 NBR Impact GHFF A

Table A47: GHFF FHA Calculations

Assessment Unit - Regional Ecosystem			AU 1		AU 2		AU 3		AU 4	
Site Reference		Maximum Score	Non-remnant (Preclear RE12.9-10.19)		Remnant (RE12.9-10.2)		Remnant (RE12.3.11)		Remnant (RE12.9-10.7)	
Site Condition (40%)	Vegetation Condition	**20**	5	This AU is mapped as Category X	20	This AU is mapped as Category B	20	This AU is mapped as Category B	20	This AU is mapped as Category B
	Species Richness	**20**	10	T2 - *C. intermedia* *E. tereticornis* *C.. tessellaris* *C. trachyphloia* *E. crebra* T3 - *C. citriodora* *C. intermedia* *E. tereticornis* *C. tessellaris* *L. suaveolens* *M. quinquenervia* *C. trachyphloia* *E. crebra* Average = 6 GHFF species	5	T1 - *C. intermedia* *C. citriodora* T8 - *E. tereticornis* *C. intermedia* *C. tessellaris* *C. citriodora* Average = 3 GHFF species	10	T4 - *C. intermedia* *L. suaveolens* *M. quinquenervia* T7 - *E. tereticornis* *L. suaveolens* *G. robusta* *A. woodsiana* Average - 3.5 GHFF species	5	T5 - *EC. citriodora* *E. tereticornis* T6 - *C. intermedia* *E. tereticornis* *L. suaveolens* *A. leiocarpa* Average = 3 GHFF species

	Flower Score	**10**	8	T2 - *C. intermedia - 0.86* *A. disparrima - 0.00* *A. excelsa - 0.00* *E. tereticornis - 0.63* *A. littoralis - 0.00* *C.. tessellaris - 0.40* *C. trachyphloia - 0.45* *E. crebra - 0.65* T3 - *C. citriodora - 0.65* *C. intermedia - 0.86* *A. disparrima - 0.00* *A. excelsa - 0.00* *E. tereticornis - 0.63* *A. littoralis - 0.00* *C. tessellaris - 0.40* *L. suaveolens - 0.40* *M. quinquenervia - 0.88* *C. trachyphloia - 0.45* *E. crebra - 0.65* Average = 0.61	5	T1 - *C. intermedia - 0.86* *A. excelsa - 0.00* *C. citriodora - 0.65* *A. disparrima - 0.00* *A. littoralis - 0.00* T8 - *E. tereticornis - 0.63* *C. intermedia - 0.86* *A. leiocalyx - 0.00* *A. disparrima - 0.00* *A. excelsa - 0.00* *C. tessellaris - 0.40* *C. citriodora - 0.65* Average = 0.34	5	T4 - *C. intermedia - 0.86* *A. excelsa - 0.00* *L. suaveolens - 0.40* *M. quinquenervia - 0.88* T7 - *E. tereticornis - 0.63* *L. suaveolens - 0.40* *A. excelsa - 0.00* *A. fimbriata - 0.00* *G. robusta - 1.00* *A. woodsiana - 0.40* *A. leiocalyx - 0.00* Average = 0.42	5	T5 - *C. Citriodora - 0.65* *A. disparrima - 0.00* *A. excelsa - 0.00* *E. tereticornis - 0.63* T6 - *C. intermedia - 0.86* *E. tereticornis - 0.63* *L. suaveolens - 0.40* *A. leiocarpa - 0.35* *A. disparrima - 0.00* *A. excelsa - 0.00* *A. maidenii - 0.00* *A. fimbriata - 0.00* Average = 0.29
	Timing of Biological Shortages	**10**	10	The species listed above cover all biological shortages	10	The species listed above cover all biological shortages	10	The species listed above cover all biological shortages	10	The species listed above cover all biological shortages
	Quality of Foraging Habitat	**20**	10	*C. intermedia, E. tereticornis, E. crebra, C. citriodora and M. quinquenervia* are considered significant GHFF foraging species (>0.65 wt p*r)	5	*C. intermedia, C. citriodora and E. tereticornis* are considered significant GHFF foraging species (>0.65 wt p*r)	10	*C. intermedia, M. quinquenervia, E. tereticornis and G, robusta* are considered significant GHFF foraging species (>0.65 wt p*r)	10	*C. citriodora, E. tereticornis, C. intermedia and E. crebra* are considered significant GHFF foraging species (>0.65 wt p*r)
	Non-native Plant Cover	**20**	10	T2 - 20.00% T3 - 20.00% Av = 20.00%	10	T1 - 35.00% T8 - 10.00% Av = 22.50%	5	T4 - 30.00% T7 - 25.00% Av = 27.50%	10	T5 - 5.00% T6 - 10.00% Av = 7.50%
	Site Condition Score	**100**	**53**		**55**		**60**		**60**	
	Site Condition Score - out of 4	**4.00**	**2.12**		**2.20**		**2.40**		**2.40**	
Site Context (30%)	Size of patch	**10**	10	The size of patch of the site is greater than 200 ha.	10	The size of patch of the site is greater than 200 ha.	10	The size of patch of the site is greater than 200 ha.	10	The size of patch of the site is greater than 200 ha.
	Connectedness	**10**	10	There are 14 active GHFF camps within a 20km radius of the site.	10	There are 14 active GHFF camps within a 20km radius of the site.	10	There are 14 active GHFF camps within a 20km radius of the site.	10	There are 14 active GHFF camps within a 20km radius of the site.

	Context	**10**	6	There is approximately 39% GHFF foraging habitat within a 20km radius of the site.	6	There is approximately 39% GHFF foraging habitat within a 20km radius of the site.	6	There is approximately 39% GHFF foraging habitat within a 20km radius of the site.	6	There is approximately 39% GHFF foraging habitat within a 20km radius of the site.
	Ecological Corridors	**10**	0	The site is not within a State corridor.	0	The site is not within a State corridor.	0	The site is not within a State corridor.	0	The site is not within a State corridor.
	Role of site location to species overall population in the state	**10**	1	There are 2 active Level 3 GHFF camps within a 20km radius of the site	1	There are 2 active Level 3 GHFF camps within a 20km radius of the site	1	There are 2 active Level 3 GHFF camps within a 20km radius of the site	1	There are 2 active Level 3 GHFF camps within a 20km radius of the site
	Threats to the species	**10**	5	There is a moderate level of threats to the species on-site. The entire road is flanked by barbed wire fencing to contain stock.	5	There is a moderate level of threats to the species on-site. The entire road is flanked by barbed wire fencing to contain stock.	5	There is a moderate level of threats to the species on-site. The entire road is flanked by barbed wire fencing to contain stock.	5	There is a moderate level of threats to the species on-site. The entire road is flanked by barbed wire fencing to contain stock.
	Site Context Score	**60**	**32**		**32**		**32**		**32**	
	Site Context Score - out of 3	**3.00**	**1.60**		**1.60**		**1.60**		**1.60**	
Species Stocking Rate (30%)	GHFF Foraging Tree Density		T2 - 350 *stems per ha* T3 - 485 *stems per ha* Av = 417.5 stems per ha		T1 - 155 *stems per ha* T8 - 169 *stems per ha* Av = 162 stems per ha		T4 - 215 *stems per ha* T7 - *75 stems per ha* Av = 145 stems per ha		T5 - *100 stems per ha* T6 - *145 stems per ha* Av = 122.5 stems per ha	
	Species Stocking Rate Score	**10**	6		6		4		4	
	Species Stocking Rate Score - out of 3	**3.00**	**1.80**		**1.80**		**1.20**		**1.20**	
		Total	**5.52**		**5.60**		**5.20**		**5.20**	
		Area (hectares)	5.90		10.30		1.20		1.50	
		Weighting	0.31		0.54		0.06		0.08	
		Weighted Scores	1.72		3.05		0.33		0.41	
		Score	**5.52**							

4.5.2. Greater Glider (Petauroides volans)

Assessment against the Significant Impact Guidelines 1.1 for the Greater Glider

EPBC Act, Greater Glider populations are listed as Endangered, effective from 05 July 2022. The species is listed under Queensland Nature Conservation Act 1992 (Qld) (NCA) as Vulnerable. As such, the Federal Significant Impact Guidelines can be utilised to determine if a significant impact on Greater Glider may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches. Frequent and intense bushfires, inappropriate prescribed burning, climate change, land clearing and timber harvesting are key threats to the Greater Glider, where loss and fragmentation of habitat has already occurred in many areas of the species range.

To determine whether the proposed action is likely to have a significant impact on the Greater Glider, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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

Assessment: The Greater Glider is mostly restricted to eucalypt forests and woodlands, although it occurs in highest abundance in taller, montane, moist eucalypt forests with abundant (large) hollow-bearing trees for shelter and a variety of eucalypt species for feeding. A variety of eucalypt species occur within and adjacent to the New Beith Road reserve, however some areas of Category X vegetation are highly disturbed and represent historical clearing with only scattered mature trees remaining. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature *Eucalyptus* sp., *Acacia* sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas (see **Section 3.4.12** for more detail). The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from vehicle use.

No evidence of Greater Glider was observed during targeted field surveys onsite. Given they are highly susceptible to existing disturbance the existing road use and increase in development within the Greater Flagstone PDA it is considered unlikely an important population of Greater Glider occupies vegetation within or adjacent to the impact site. Once vegetation on surrounding areas as part of the Greater Flagstone area have been cleared, there will be limited connectivity to the referral area and adjoining vegetation to the west, aside from retained waterway areas throughout the road reserve (**Plan A10**). The proposed action is unlikely to reduce the size of the population because the site is already fragmented and will be further impacted as a result of surrounding development and does not currently display evidence of Greater Glider usage. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Greater Glider populations in the area.

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

Assessment: Field surveys confirmed the presence of hollow bearing trees within the road reserve and scattered within adjacent remnant bushland. No individuals were recorded during field surveys. Records of this species have been recorded within 15 km of the site, in Flinders Peak Conservation Park on BioMaps. No recent records of the Greater Glider are recorded within the referral area and none are recorded within 5 km of the site (**Plan A11**). Due to the high disturbance with vehicle use and other illegal uses, and the modification of surrounding habitat it is considered poor quality habitat for the species.

Notably, on review it is considered by the Department that edge effects from development and threats can encroach within 100 m to potential habitat areas deterring Greater Glider persistence (refer Conservation Advice). The proposed road alignment is already disturbed by past clearing, both within the alignment and in adjoining cleared development areas, and utilisation by vehicles creating noise, light and dust. The relative disturbance levels within the proposed alignment suggest that the area is unlikely to suitable for the Grater Glider as per the Conservation Advice.

In addition, surrounding impact from earmarked development is likely to restrict the extent of habitat for Greater Glider and connectivity to the referral area will be largely isolated from other Greater Glider habitat (**Plan A10**). While the proposed action will remove potential Greater Glider habitat, the impact is focused on a site that will be inaccessible to Greater Glider and adjoin a major road and residential development. Therefore, due to the above considerations it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Greater Gliders.

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

Assessment: The site is currently subject to significant fragmentation from the existing road and development to the north. Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment habitat within the existing road reserve. In the wider landscape, significant fragmentation currently exists to the north and east, with residential development and major railway infrastructure in these areas. Land clearing and ongoing vehicle disturbance on land to the south of the road reserve further fragments potential habitat onsite.

Field surveys confirmed the presence of hollow bearing trees within the road reserve and scattered within adjacent remnant bushland however no individuals were recorded during field surveys. Due to the high disturbance with vehicle use and other illegal uses, and the modification of surrounding habitat it is considered poor quality habitat for the Greater Glider. Connectivity to vegetation is limited with residential areas to the north and cleared modified areas in the south and southwest. Vegetation associated with Flagstone Creek remains a form of connectivity from vegetation in the east to larger intact bushland in the west, however, is currently fragmented due to the existing cleared road. Notably, the proposed road will include best practice fauna movement opportunities through retained corridors associated with Flagstone and Abrade Creeks (refer **Plan A32**).

Online databases show Greater Glider presence within 10 km of the site, towards the north and the west where larger patches of vegetation occur (**Plan A11**). However these records occur beyond existing residential developments to the north suggesting it is unlikely this population would utilise the site. Therefore, removal of the potential habitat is unlikely to fragment any existing populations.

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

Assessment: The Significant Impact Guidelines provide the following definition for 'habitat critical to the survival of a species'. "Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- For activities such as foraging, breeding, roosting or dispersal
- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- To maintain genetic diversity and long-term evolutionary development
- For the reintroduction of populations or recovery of the species or ecological community.

Responses to the definition of habitat critical to the survival of a species follows below:

- The referral site shows no evidence of current Greater Glider usage. The vegetation on site contains some habitat values in the form of hollow bearing trees however higher quality habitat further from disturbances occurs west of site which contains greater connectivity in the broader landscape and offers more preferential habitat for foraging, breeding, roosting and dispersal.
- Substantial clearing has occurred within the northern and central extents of the road reserve. In this area, vehicle disturbance is common among other illegal uses. However, throughout the road reserve, large mature hollow-bearing trees remain which provide potential habitat for the Greater Glider. Due to fragmentation to the adjacent bushland, high disturbance levels and a lack of local records, it is considered a low likelihood that these hollow-bearing trees are being utilised by Greater Glider due to inconsistent connectivity with current records.
- Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Greater Glider within the referral area, suggesting the vegetation on-site is not currently utilised by Greater Glider. The referral area is therefore unlikely to contribute to genetic diversity of the species.
- The referral area will be isolated from other Greater Glider habitat onsite following the development of surrounding residential areas. The referral area forms part of the Flagstone City development area which will consist of future residential areas. In addition, significant current threats exist within and surrounding the referral area including wild dogs, vehicle use, weed encroachment, illegal offroad vehicle use and the train line further east. The referral site is not considered suitable for the reintroduction of Greater Glider.

Notably, the vegetation on site meets the criteria listed in the conservation advice being a large contiguous area of eucalypt forest, which contains mature hollow-bearing trees and a diverse range of the species' preferred food species so is therefore considered to be habitat critical to the survival of the

species. This means there is likely to be a significant impact to the Greater Glider as a result of the action as per the conservation advice.

5. **Disrupt the breeding cycle of an important population.**

   Assessment: Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Greater Glider within the referral area, suggesting the vegetation on-site is not utilised by Greater Glider. Furthermore, no records within 5 km of the site have been observed within the last 20 years (**Plan A11**). It is not considered that the proposed action would disrupt the breeding cycle of a population of Greater Glider as there is a lack of indication of breeding population on-site. Greater Glider do not have specific habitat requirements of breeding and the removal of the potential habitat in the relatively small area of the referral site is unlikely to disrupt the breeding cycle of the population. Further, connectivity will be facilitated by the provision of best-practice fauna passage.

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 referral area is subject to significant disturbance and modification from clearing, offroad vehicle use and rubbish dumping. Further, the road easement includes existing power lines that lead to the reservoir on top of Round Mountain that present a potential additional fragmenting factor and threat. It is unlikely that Greater Glider are utilising the hollow-bearing trees onsite as these are fragmented from the existing bushland and there was no evidence of Greater Glider detected onsite. It is not considered that the proposed action will impact the habitat on-site to the extent that the species is likely to decline.

   Higher quality habitat exists to the west of site in association with Spring Mountain – White Rock Conservation park which contains a greater proportion of hollow bearing trees and foraging species (**Plan A10**).

   As there is no evidence that Greater Glider is present on-site, and the site is not conducive for dispersal or long-term presence on the site due to the high level of fragmentation, it is unlikely that the proposed development will result in the decline of the species

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

   Assessment: Invasive species such the feral cat (*Felis catus*) and Dogs (*Canis lupus familiaris*) are identified as threats to the species. 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.**

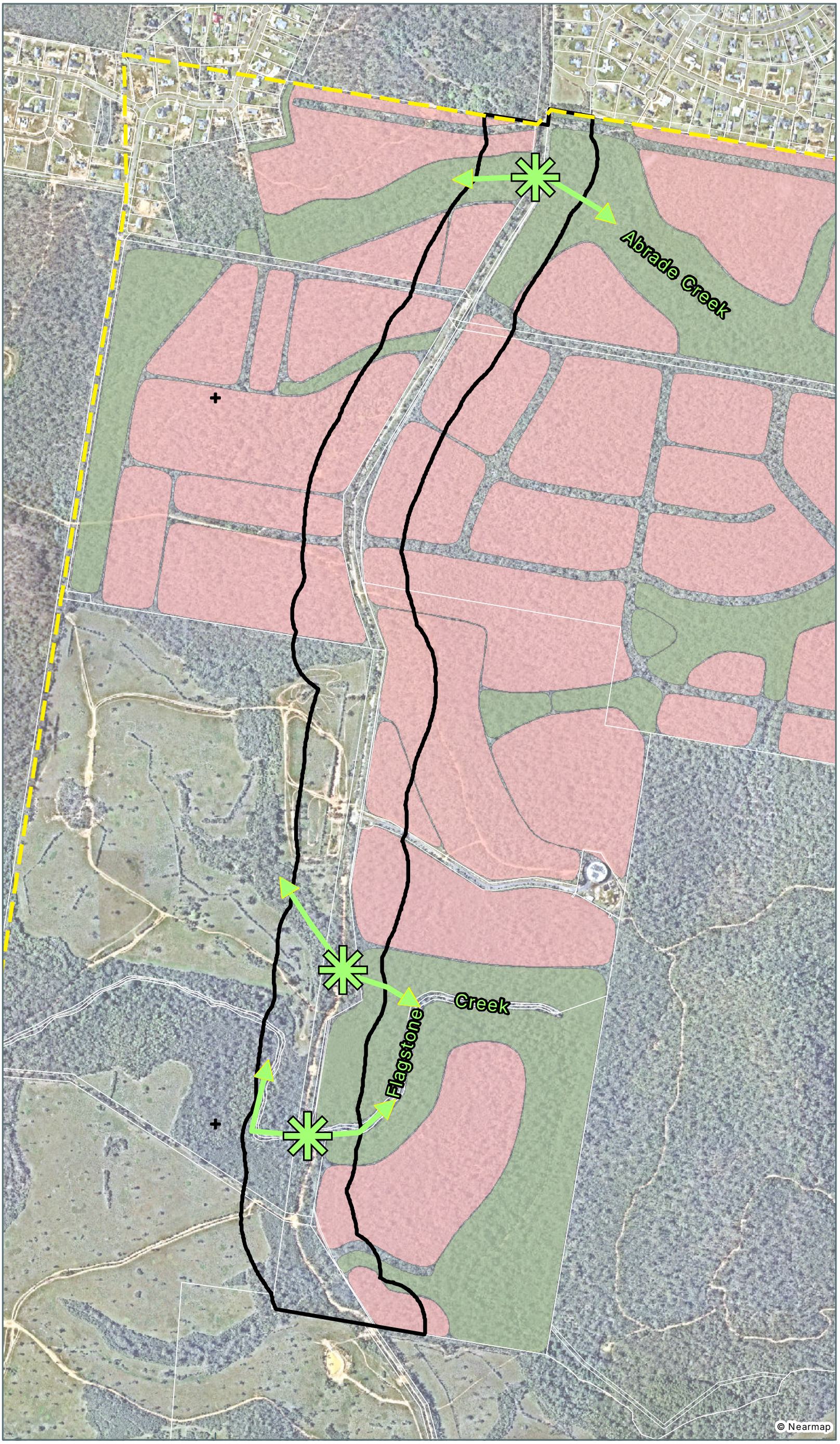
Assessment: The Greater Glider does not have an adopted National Recovery Plan published by the Commonwealth of Australia. The Conservation Advice lists Conservation and management priorities for the Greater Glider. However, conservation and recovery actions are listed in the *Petauroides volans (greater glider (southern and central) Conservation Advice* (DCCEEW, 2022). Management priorities involve limiting habitat loss and fragmentation, reducing mortality and removal of hollow-bearing trees and implementing measures to limit the occurrence of wildfires in Greater Glider habitat.

Detailed studies did not detect any evidence of Greater Glider within the referral area, suggesting the vegetation on-site is not utilised by Greater Glider. In addition, surrounding vegetation falls within the Greater Flagstone PDA which are earmarked for development. Once vegetation within these areas are cleared, the referral area will be isolated from other Greater Glider habitat (**Plan A10**). The referral site is not suitable for the reintroduction of Greater Glider nor will it be able to aid in the recovery of the species.

Summary

Potential foraging and denning habitat for the Greater Glider as per the Conversation Advice will be cleared under the proposal, and the road upgrade has potential to indirectly impact on potential habitat within 100 m. Therefore an impact assessment has been completed.

A32. FAUNA CROSSING LOCATIONS



Notes:
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LEGEND

- Qld DCDB
- Referral Area
- Greater Flagstone Priority Development Area
- Impact areas
- Retained open space corridors
- Fauna friendly passage solution as per DTMR Guidelines

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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15/10/2025

8418 E A32 NBR Fauna Crossing A

Greater Glider Impact Assessment

The proposed action will be entirely located within the referral area and will require the removal of 16.8 ha of vegetation considered potential habitat for the Greater Glider, and taking into consideration 100 m buffers to existing development as per the Conservation Advice, an additional 58.5 ha of potential Greater Glider habitat will be indirectly impacted, making a total impact area of 75.3 ha (refer **Plan A33**).

A total of 204 medium and large hollows will be directly and indirectly impacted under the proposal (**Plan A33**). It is detailed in Eyre et al., 2022, that accuracy of on-ground observers can vary substantially with observer experience, bias and perspective, with both under- and over-estimation of hollows apparent across studies and observers. This is referenced within the Conservation Advice and as such, a detailed review of the peer reviewed literature listed within Chapter 7 of Eyre et al. (2022) was completed and is summarised below. The intention was to determine the likely average misrepresentation of hollows via visible hollow presence surveys. This would feed into determining a more suitable approach to assessment, using visible large (8cm and over) hollows and an average percentage of error above this number to account for potential missed hollows via any observer bias.

Woolley et al. (2018) assessed difference in ground-based tree hollow count methodology using visual assessment by eye and binoculars, cross referencing with assessment of a subset of these trees via climbing arborist and/or tree felling hollow count. The results showed a slight over estimation of hollow presence during the ground-based assessments (approximately 10%), but overall, results were highly correlated between methods.

Koch et al. (2008) assessed a range of different hollow count and estimation methods to determine the most effective in determining true hollow presence and size. Statistical methods including hierarchical partitioning via linear modelling was used to determine the most effective across all five methods. Although all methods were highly correlated with each other, pre-felling ground-based visual hollow assessments were determined to be the most accurate of hollow presence assessment methods.

Harper et al. 2004 found that a mean of 82% of trees were correctly identified via ground-based visual surveys as being hollow-bearing and 89% were correctly identified as being non-hollow-bearing. A single observer deemed inexperienced was an outlier, dragging the mean down, with the mean lying around 85% where this person's observations were excluded.

Rayner et al. (2011) assessed hollow presence using two methods, ground-based visual assessment via binoculars and confirmed with climbing surveys, for a subset of 100 trees. Only 2 trees (2%) were misidentified as having no hollows but were hollow bearing. However, 12 trees (12%) were identified as having hollows but did not support hollows. As such, the tendency to overestimate hollow presence, was also observed in this study.

Penton et al. 2020 found an overestimation via on ground visual assessment through presence of arboreal termitaria in northern parts of Australia. Given this presence of arboreal termitaria is much less prevalent in SEQ, this is unlikely to substantially influence assessors' observations in the current project.

Kelly et al. 2011 looked at variation in assessors' observation of hollows, finding that with training and experience, individuals were more consistent. Our ecologists spend the majority of their first few years, and a good proportion of time, thereafter, completing tree plots and quantifying and are quite experienced in this.

From the literature, observer bias was strongly in favour of over estimation of hollows via ground-based visual assessment conducted by experienced observers (typically ecologists). As such, on average it could be construed that the number of suitable hollows on a site would be overestimated and as such, this would be a positive outcome in regards to providing offsets for hollow presence at an impact site. However, in order to counter any potential error, an additional number of hollows are to be assumed, given the potential for some hollows to be missed due to observer bias. From the literature, a buffer of 20% of the number of hollows to be impacted, would be in excess of any average observer errors, and as such, is presented as a suitable option to ensure a positive conservation outcome in regards to not underrepresenting suitable greater glider hollows as a component of critical habitat.

To accurately assesses the impacts on Greater Glider both an area-based assessment using species specific MHQA and features-based assessment for lost denning hollows has been applied. Notably, the features-based assessment for lost hollows will be utilised to ensure that like for like denning and shelter attributes can be provided at the proposed offset site.

Greater Glider Habitat - Modified Habitat Quality Assessment Tool

The subject site has been assessed using a modified version of the Queensland State Governments "Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy" Version 1.2 April 2017. The purpose of this guideline is to provide a methodology for proponents to determine the habitat quality of a site under the Queensland Environmental Offsets framework. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES).

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

For the spatial analysis, the modified habitat quality assessment (MHQA) combines the three (3) key indicators from the Queensland State Government guide into two (2) (site condition and site context) with each being weighted 30% of the final score. The balance of the weighting, 40%, has been attributed to the third indicator (species stocking rate), that is independent of the Queensland State Government habitat quality assessment. The species stocking rate has been added to the MHQA to better incorporate MNES, and specifically the endangered Greater Glider. The following subsections detail the methodology utilised to assess the site condition, site context and species stocking rate under the MHQA.

The features based assessment to cater for Greater Glider denning and breeding habitat relies on hollow counts plus an error margin of 20% for field surveys based on relevant literature.

Site Condition (30%)

The site condition assessment under the MHQA is assessed using 15 condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;
- large trees;
- coarse woody debris;
- non-native plant cover;
- quality and availability of food and foraging habitat; and
- quality and availability of shelter.

Assessment of the above condition characteristics do not differ from the traditional habitat quality assessment. Scoring tables for the site condition attributes follows the scoring tables within the BioCondition manual (refer above). In developing the MHQA to better incorporate MNES, two (2) species habitat index characteristics, being, (1) quality and availability of food and foraging habitat, and (2) quality and availability of shelter have been added to the site condition indicator. The quality and availability of food and foraging habitat index attributes are based on the site condition features that relate to the presence of canopy in the ecologically dominant layer where the species feeds scored as a proportion against the T1 tree canopy cover benchmark, where <33% of the expected benchmark scores 1, 33% to 66% scores 5, and >66% scores 10. The T1 canopy cover is considered a suitable metric for foraging habitat given the size class includes only the T1 dominant layer and all Regional Ecosystems contain Greater Glider foraging species within the ecologically dominant layer according to the relevant Regional Ecosystem technical descriptions. The quality and availability of shelter habitat index attributes are based on hollow counts per hectare plus an error margin of 20% based on relevant literature relative to conservation advice expectations (i.e. 2 to 4 hollows per 2 ha), where <1 hollow per ha scores 1, 1 to 2 hollows per ha scores 5, and greater than 2 hollows per ha scores 10.

As the Greater Glider is most reliant upon upper tree canopy for foraging and hollows for shelter than other ecosystem attributes, the overall Site Condition score has been additionally weighted 40% for the traditional condition attributes (species richness etc.), 20% for quality of foraging habitat and 40% for quality of shelter habitat.

Site Context (30%)

The site context assessment deals with the site and its adjacent surroundings. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and State

mapped ecological corridors. Under the MHQA, site context is measured using the following seven characteristics:

- size of patch (refer **Plan A4**);
- connectedness (refer **Plan A34**)
- context (refer **Plan A34**)
- State mapped ecological corridors (refer Plan **A29**);
- role of site location to species overall population in the state;
- threats to the species; and
- species mobility capacity.

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Greater Glider habitat as per Eyre et al. 2022.

Assessment methodology for site context assessment for Greater Glider is outlined below:

1. patch size – The calculation of the area of the patch size uses the method outlined in the Biocondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors.
2. connectedness – Connectivity relates to the capacity that the species have to disperse through the landscape. The attribute is calculated using GIS by measuring the length of habitat that is along the boundary of the site.
3. context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. The attribute is measure of the percentage of habitat within a 1 km buffer of the site.
4. State mapped ecological corridors – This attribute is as per the methods of the *Guide to determining terrestrial habitat quality V1.2* and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, this is not their primary function when assessing the attribute. The ecological corridors have been mapped by the Queensland State Government under the 'CORR_TYPE' attribute table. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.
5. 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.

6. threats to species – Threats to Greater Glider are predominantly habitat loss, timber harvesting, feral predator attack, barbed wire and uncontrolled bushfire. A risk matrix relative to the conservation advice for the Greater Glider was applied to determine threats to species:
    - Habitat loss is considered Very High Risk under the Greater Glider conservation advice. Clearing and fragmentation 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 Greater Glider 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).
    - Timber harvesting is considered Very High Risk under the Greater Glider conservation advice. Timber harvesting is scored Low, Moderate and High relative to the implementation and frequency of timber harvesting and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Feral Cat attack is considered Low Risk under the Greater Glider conservation advice. Feral Cat attack is scored Low, Moderate and High relative to the presence of Feral Cats and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Fox attack is considered Low Risk under the Greater Glider conservation advice. Fox attack is scored Low, Moderate and High relative to the presence of Foxes and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Barbed wire entanglement is considered Low Risk under the Greater Glider conservation advice. Barbed wire entanglement is scored Low, Moderate and High relative to the amount of barbed wire in and bordering the site and weighted according to risk factor relative to the expected threat score for each (summed vertically as 15, 7 or 1).
7. species mobility capacity – This attribute is a measure of the presence and severity of factors that would contribute to a reduction in mobility of Greater Glider and is scored on the presence of roads or cleared areas.

In developing the MHQA, three (3) species habitat index characteristics were nominated — role of site location to overall species population in the state, threats to the species and species mobility capacity.

Species Stocking Rate (40%)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Greater Glider carrying capacity of the site at the time of undertaking the survey. Given the discreet nature of the Greater Glider 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 of Greater Glider on or adjacent to the assessment unit.
- Species usage of the site (habitat type and evidenced usage) – evidence of Greater Glider usage of the assessment unit.
- Approximate density of the species on the site – evidence of Greater Glider records in the assessment unit.
- Role/importance of species population on site – considers whether the site is a key source population for breeding, dispersal, is necessary for maintaining genetic diversity or near the limit of the species' range.

A33. GREATER GLIDER IMPACTS

Notes:
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Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- QId DCDB
- Referral Area [90.4 ha]
- Existing cleared track
- Direct Impact
- Indirect Impact

Engineering Detail

- Road Design
- Batters

Assessment Units Impacted

- *Assessment Unit 1:* Pre-clear RE 12.9-10.19a [5.9 ha directly impacted, 25.7 ha indirectly impacted]
- *Assessment Unit 2:* Pre-clear RE 12.9-10.2/12.9-10.7 [8.2 ha directly impacted, 25.2 ha indirectly impacted]
- *Assessment Unit 3:* Pre-clear RE 12.3.11/12.3.7 [1.5 ha directly impacted, 4.7 ha indirectly impacted]
- *Assessment Unit 4:* Pre-clear RE 12.9-10.7a [1.2 ha directly impacted, 2.9 ha indirectly impacted]

Hollow Tree Plot

- Tree with medium hollows (total medium hollows directly impacted: 44)
- Tree with large hollows (total large hollows directly impacted: 114)
- Tree with medium hollows (total medium hollows indirectly impacted: 36)
- Tree with large hollows (total large hollows indirectly impacted: 10)

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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New Beith Road

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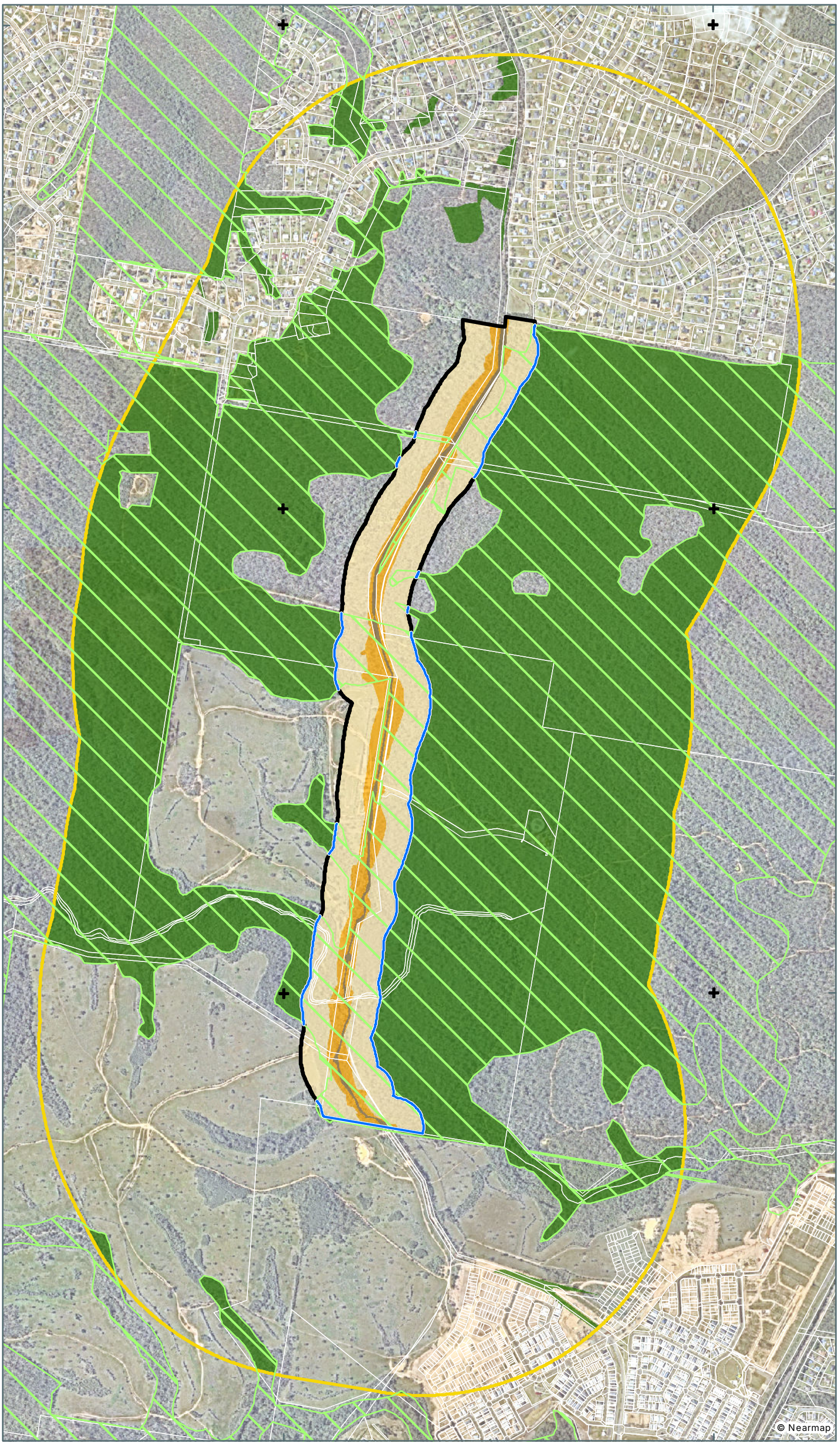
15/10/2025

8418 E A33 NBR Impact GG A

A34. GREATER GLIDER CONTEXT ASSESSMENT



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

Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- Qld DCDB
- Referral Area
- Existing Impact
- Direct Impact
- Indirect Impact
- 1km buffer
- Percentage of direct/indirect impact boundary length supporting a connection off and on site to Greater Glider habitat - 56%
- Percentage of Greater Glider habitat within 1km of direct/ indirect impact area (48%)
- Size of Greater Glider habitat patch > 500 ha

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:15,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

Saunders Havill
BOWENHILLS | SPRINGFIELD
1300 123 744 | mail@saundershavill.com

PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

15/10/2025

8418 E A34 NBR GG Context A

Discussion – Quantum of Impact

The habitat quality scores for each assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A49** to **Table A57**. 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 hollow counts are used for Quality and Availability of Shelter.

Site Condition (30%)

AU1 (Non-remnant RE12.9-10.19a) achieved an average score for Site Condition of **1.93** out of 3. AU2 (Remnant RE12.9-10.2) achieved an average score for Site Condition of **2.03** out of 3. AU3 (Remnant RE12.3.11) achieved an average score for Site Condition of **1.37** out of 3. AU4 (Remnant RE12.9-10.7) achieved an average score for Site Condition of **1.99** out of 3.

The transects generally scored poorly for large trees per ha, coarse woody debris, and non-native plant cover and scored moderately for species richness of shrubs, grasses and forbs. Refer to **Appendix A10** for raw MHQA data and photos facing north, south, east and west captured at the 50 m transect mark for each transect. As per the recorded canopy cover, all assessment units scored a 10 for quality and availability of food and foraging habitat. Based on hollow counts, Assessment Units 1, 2 and 4 scored 5 and AU3 scored 1 for quality and availability of shelter habitat.

Site Context (30%)

The results of the Greater Glider context assessment are present in **Plan A34**. The patch size was determined to be > 500 hectares. The percentage of boundary length of the impact was calculated at 56% and the percentage of habitat within 1 km of the impact site is 48%.

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 connected to the site in this instance. This attribute is scored such that is reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS, and achieved a score of 10 out of 10 as the site was calculated to be >500 ha (greater than 200 ha as per the *Queensland BioCondition Assessment* methodology (**Plan A34**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected with adjacent Greater Glider habitat. Connectedness relates to the capacity of the species to disperse through the landscape between sustainable patches of habitat, and therefore has important implications for species persistence. Connectedness was calculated using GIS, with the percentage of project area boundary length supporting habitat connection off and on-site was calculated at 56%, and consequently this attribute scored a 4 out of 5 (**Plan A34**).

Context

The context attribute refers to the amount of habitat that is retained within a 1 km buffer of the site being assessed and is calculated using GIS. Retained habitat within a 1 km buffer of the site was calculated at 48%, and therefore the context attribute achieved a score of 4 out of 5 (**Plan A34**).

Ecological Corridors

GIS mapping was utilised to identify the site's role in any ecological corridors on or adjacent to the site (refer **Plan A29**). The site does not form part of any mapped ecological corridors. Therefore, this attribute was scored 0 out of 6.

Role of site location to species overall population in the state

This attribute aims to quantify the geographical importance of the site for Greater Glider populations across the broader state. This attribute achieved a score of 5 out of 5 given the site contains potential habitat for the Greater Glider.

Threats to the species

The threats to the species attribute aims to quantify the risk to survival of the Greater Glider on-site. Key known threats to the survival of the species include the existing roads and canopy breaks, as well as predation by feral animals and uncontrolled fire regimes.

Table A48 provides a risk matrix relative to the conservation advice for the Greater Glider to determine threats to species. Essentially, each of the threats identified within the conservation advice is weighted relative to the identified level of risk, with the weighted scores summed to provide the threat score, noting the MHQA allows for only scores of 1 (high), 7 (moderate) or 15 (low) for threats.

Table A48: Threat Matrix for Greater Glider

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

Metric	Low	Moderate	High
Score Weighting	**4**	**1.8**	**0.25**
Inappropriate Fire Regimes Very High Risk	Current Government endorsed Bushfire Management Plan (BMP) to protect the Greater Glider is in effect.	Non-Greater Glider specific BMP in effect. or; Low fuel load and low fire risk.	Site has a high fuel load and/or high fire risk.
Score Weighting	**4**	**1.8**	**0.25**
Timber Harvesting Very High Risk	No timber harvesting on site.	Historical timber harvesting having occurred on site	Current timber harvesting occurring on site
Score Weighting	**4**	**1.8**	**0.25**
Feral Cat Attack Low Risk	No feral cats recorded on site.	Feral cats recorded on site and adequate refuge for Greater Glider (>70% canopy cover).	Feral cats recorded on site and limited refuge for Greater Glider (<70% canopy cover)
Score Weighting	**1**	**0.53**	**0.08**
Fox Attack Low Risk	No foxes recorded on site.	Foxes recorded on site and adequate refuge for Greater Glider (>70% canopy cover).	Foxes recorded on site and limited refuge for Greater Glider (<70% canopy cover)
Score Weighting	**1**	**0.53**	**0.08**
Barbed Wire Entanglement Low Risk	No barbed wire on or adjoining the site	Up to 50% of the site and boundary is traversed by barbed wire	More than 50% of the site and boundary is traversed by barbed wire
Score Weighting	**1**	**0.53**	**0.08**
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)

The site is considered to have a high fuel load being unmanaged remnant and regrowth vegetation and multiple burnt out cars are present, including one dumped and set alight while field work was being undertaken. The site scores high for inappropriate fire regimes.

The site is zoned for development. No timber harvesting occurs on site. Foxes and Cats were not recorded on site. The entire road is flanked by barbed wire fencing to contain stock.

Analysis against the risk matrix suggests that the site scores 6.58, or a 7 out of a possible 15 for threats (**Table A48**).

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 in order to meet its needs for survival. 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 highways or residential developments. Conversely, the Greater Glider is considered a relatively immobile species due to its slow-moving nature and vulnerability to threats on ground as outlined above. Notably, species mobility is compromised where canopy gaps occur as presented by the existing road reserve and cleared tracks and fire trails. In this instance, the species mobility capacity for the Greater on-site was assigned the conservative moderate score of 7 out of 10.

Species Stocking Rate (40%)

The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Greater Glider carrying capacity of each assessment unit at the time of undertaking the survey. A species stocking rate score of 20 out of 70 was attributed to all assessment units. This was largely attributed to the fact that evidence of Greater Glider does not occur onsite nor in the vicinity given their inability to disperse long distances, however, potential breeding habitat is present in the form of denning opportunities supported by foraging habitat.

Summary

To summarise, the action is considered to impact on potential habitat for the Greater Glider, having a total impact of **5.06 out of 10** (refer **Table A53**).

For the features-based assessment, as per **Plan A33**, the site maintains a total of 204 hollows that will be directly or indirectly impacted. Applying a 20% margin to account for survey error, an estimate of 245 hollows will be impacted.

Table A49: MHQA Assessment – AU1

Assessment Unit - Regional Ecosystem - GG	AU 1 - Cat X - cleared with scattered regrowth (Preclear RE12.9-10.19a)					
	RE12.9-10.19a Benchmark	Transect 2	Transect 3	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	100	100	100	5
Native plant species richness - trees	4	10	11	10.5	262.50	5
Native plant species richness - shrubs	6	1	3	2	33.33	2.5
Native plant species richness - grasses	7	6	5	5.5	78.57	2.5
Native plant species richness - forbs	14	7	12	9.5	67.86	2.5
Tree canopy height (Canopy)*	24	22	21	21.5	89.58	5
Tree canopy height (Sub-canopy)*	10	15	16	15.5	155.00	5
					*Average tree canopy height	5
Tree canopy cover (Canopy)**	59	95.4	53.1	74.25	125.85	5
Tree canopy cover (Sub-canopy)**	22	58.1	71.2	64.65	293.86	3
					**Average tree canopy cover	4
Shrub canopy cover	11	16.9	0.7	8.8	80.00	5
Native grass cover*	16	15	27	21	131.25	5
Organic litter*	53	67	48	57.5	108.49	5
Large trees (euc plus non-euc) (per ha)	24	0	0	0	0.00	0
Coarse woody debris (per ha)	285	136	70	103	36.14	2
Non-native plant cover	0	20	20	20	20.00	5
Quality and availability of food and foraging habitat	NA	10	10	10	-	10
Quality and availability of shelter	NA	5	5	5	-	5
					Site Condition Score (/100)	64.25
					Overall Site Condition Score - out of 3	1.93
SITE CONTEXT						
Size of patch	10	10	10	10		10

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
Greater Glider Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	20	20	20		**20**
					Species Stocking Rate Score (/70)	**20.00**
					Overall Species Stocking Rate Score - out of 4	**1.14**
Overall Assessment Unit Score						**5.05**

Table A50: Species Stocking Rate Results – AU1

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	0/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**20/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A51: MHQA Assessment – AU2

Assessment Unit - Regional Ecosystem - Greater Glider	AU 2 - Cat B - highly disturbed remnant veg with scattered mature Eucalypt species (RE12.9-10.2)					
	RE12.9-10.2 Benchmark	Transect 1	Transect 8	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	50	75	75	3
Native plant species richness - trees	6	5	7	6	100.00	5
Native plant species richness - shrubs	7	5	5	5	71.43	2.5
Native plant species richness - grasses	7	6	5	5.5	78.57	2.5
Native plant species richness - forbs	13	9	13	11	84.62	2.5
Tree canopy height (Canopy)*	21	21	17	19	90.48	5
Tree canopy height (Sub-canopy)*	12	12	12	12	100.00	5
					*Average tree canopy height	5
Tree canopy cover (Canopy)**	64	77.3	44.6	60.95	95.23	5
Tree canopy cover (Sub-canopy)**	20	50.9	67.3	59.1	295.50	3
					**Average tree canopy cover	4
Shrub canopy cover	6	1.1	18.6	9.85	164.17	5
Native grass cover*	21	6	2	4	19.05	1
Organic litter*	48	51	55	53	110.42	5
Large trees (euc plus non-euc) (per ha)	38	38	4	21	55.26	10
Coarse woody debris (per ha)	506	446	92	269	53.16	5
Non-native plant cover	0	35	10	22.5	22.50	5
Quality and availability of food and foraging habitat	NA	10	10	10	-	10
Quality and availability of shelter	NA	5	5	5	-	5
					Site Condition Score (/100)	67.75
					Overall Site Condition Score - out of 3	2.03
SITE CONTEXT						
Size of patch	10	10	10	10		10

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
Greater Glider Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	20	20	20		**20**
					Species Stocking Rate Score (/70)	**20.00**
					Overall Species Stocking Rate Score - out of 4	**1.14**
Overall Assessment Unit Score						**5.16**

Table A52: Species Stocking Rate Results – AU2

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	0/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**20/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A53: MHQA Assessment - AU3

Assessment Unit - Regional Ecosystem - Greater Glider	AU 3 - Cat B - Remnant vegetation associated with Flagstone Creek (RE12.3.11/12.3.7)					
	RE12.3.11 Benchmark	Transect 4	Transect 7	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	100	100	0	50	50	3
Native plant species richness - trees	7	4	8	6	85.71	2.5
Native plant species richness - shrubs	7	3	4	3.5	50.00	2.5
Native plant species richness - grasses	12	2	2	2	16.67	0
Native plant species richness - forbs	25	6	11	8.5	34.00	2.5
Tree canopy height (Canopy)*	23	23	19	21	91.30	5
Tree canopy height (Sub-canopy)*	8	8	14	11	137.50	5
					*Average tree canopy height	5
Tree canopy cover (Canopy)**	56	63.7	28.2	45.95	82.05	5
Tree canopy cover (Sub-canopy)**	33	52.3	79.5	65.9	199.70	5
					**Average tree canopy cover	5
Shrub canopy cover	20	21.4	16.5	18.95	94.75	5
Native grass cover*	44	8	67	37.5	85.23	3
Organic litter*	37	57	6	31.5	85.14	5
Large trees (euc plus non-euc) (per ha)	30	14	8	11	36.67	5
Coarse woody debris (per ha)	555	289	178	233.5	42.07	2
Non-native plant cover	0	30	25	27.5	27.50	3
Quality and availability of food and foraging habitat	NA	10	10	10	-	10
Quality and availability of shelter	NA	1	1	1	-	1
					Site Condition Score (/100)	45.75
					Overall Site Condition Score - out of 3	1.37
SITE CONTEXT						
Size of patch	10	10	10	10		10

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
Greater Glider Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	20	20	20		**20**
					Species Stocking Rate Score (/70)	**20.00**
					Overall Species Stocking Rate Score - out of 4	**1.14**
Overall Assessment Unit Score						**4.50**

Table A54: Species Stocking Rate Results – AU3

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	0/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**20/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A55: MHQA Assessment – AU4

Assessment Unit - Regional Ecosystem - Greater Glider	AU 4 - Cat B - Eucalypt dominated remnant veg. (RE12.9-10.7)					
	RE12.9-10.7 Benchmark	Transect 5	Transect 6	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	100	**100**	100	**5**
Native plant species richness - trees	**3**	4	8	**6**	200.00	**5**
Native plant species richness - shrubs	**5**	3	6	**4.5**	90.00	**2.5**
Native plant species richness - grasses	**8**	3	4	**3.5**	43.75	**2.5**
Native plant species richness - forbs	**26**	6	10	**8**	30.77	**2.5**
Tree canopy height (Canopy)*	**21**	16	17	**16.5**	78.57	5
Tree canopy height (Sub-canopy)*	**10**	8	5	**6.5**	65.00	3
					***Average tree canopy height**	**4**
Tree canopy cover (Canopy)**	**40**	18.6	51.9	**35.25**	88.13	5
Tree canopy cover (Sub-canopy)**	**8**	78.9	89.8	**84.35**	1054.38	3
					****Average tree canopy cover**	**4**
Shrub canopy cover	**3**	12.2	1.3	**6.75**	225.00	**3**
Native grass cover*	**61**	2	35	**18.5**	30.33	**1**
Organic litter*	**20**	91	36	**63.5**	317.50	**3**
Large trees (euc plus non-euc) (per ha)	**18**	18	10	**14**	77.78	**10**
Coarse woody debris (per ha)	**272**	604	232	**418**	153.68	**5**
Non-native plant cover	**0**	5	10	**7.5**	7.50	**5**
Quality and availability of food and foraging habitat	**NA**	10	10	**10**	-	**10**
Quality and availability of shelter	**NA**	5	5	**5**	-	**5**
					Site Condition Score (/100)	**66.25**
					Overall Site Condition Score - out of 3	**1.99**
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
Greater Glider Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	20	20	20		**20**
					Species Stocking Rate Score (/70)	**20.00**
					Overall Species Stocking Rate Score - out of 4	**1.14**
Overall Assessment Unit Score						**5.11**

Table A56: Species Stocking Rate Results – AU4

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	0/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**20/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A57: Greater Glider MHQA Score Summary

MHQA Final Weighting - GG	AU 1	AU 2	AU 3	AU 4
Site Condition (/3)	1.93	2.03	1.37	1.99
Site Context (/3)	1.98	1.98	1.98	1.98
Species Stocking Rate (/4)	1.14	1.14	1.14	1.14
Assessment Unit Area (Impact) (ha)	31.60	33.40	6.20	4.10
Total Impact Area (ha)	75.30	75.30	75.30	75.30
Size Weighting	0.42	0.444	0.08	0.05
AU Weighted Score	2.12	2.29	0.37	0.28
Total Weighted Score	**5.06**			

4.5.3. South-eastern Glossy Black Cockatoo (*Calyptorhynchus lathami lathami*)

The Glossy Black-cockatoo is listed as Vulnerable under the EPBC Act effective from 10th August 2022. The Federal Significant Impact Guidelines are to be utilised to determine if a significant impact on Glossy Black-cockatoo may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches. Habitat loss, degradation and fragmentation are the main threats to Glossy Black-cockatoo at present. Additional threats include wildfires, inappropriate fire management, climate change, invasive weeds, disease, predation and competition.

To determine whether the proposed action is likely to have a significant impact on the Glossy Black-cockatoo, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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

Assessment: The New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature *Eucalypt sp*., *Acacia sp*. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

Field surveys located only scattered isolated black sheoak (*A. littoralis*) in areas of the remnant vegetation adjacent to and within the New Beith Road reserve, with no large stands observed. No evidence of the Glossy Black-cockatoo was observed during detailed field surveys and searches of potential habitat areas did not identify feeding "orts" within *Allocasuarina littoralis* stands. Records of the species are scattered in a pocket of vegetation to the north-east, north west and west with a total of 24 over the last 20 years (**Plan A13**). There is only one (1) record of the species on BioMaps since 2013 within a 5 km radius of the site. It is unlikely a population of this species is using vegetation onsite for breeding or roosting, as there is substantially higher quality available habitat to the west of the road reserve. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Glossy Black-cockatoo populations in the area.

2. Reduce the area of occupancy of an important population

Assessment: Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by Glossy Black-cockatoo. No evidence of Glossy Black-cockatoo activity was recorded on-site in the form of feeding "orts" within *Allocasuarina littoralis*. Surrounding impact from earmarked development is likely to restrict the extent of available habitat onsite and connectivity to the referral area will be largely isolated from other habitat (**Plan A3**). Given the higher quality habitat to the west of the referral area and

significant disturbance onsite from vehicle usage, it is unlikely the species is utilising vegetation onsite for breeding or roosting. Furthermore, the closest record of the species occurs approximately 4 km from the subject site, more abundant records are found within pockets of vegetation to the east, west and north outside of the impact are and buffer (**Plan A13**). Due to the above considerations combined it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy of an important population of the Glossy Black-cockatoo.

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

Assessment: The Glossy Black-cockatoo prefers woodland areas dominated by she-oak *Allocasuarina littoralis*, or open sclerophyll forests and woodlands with a stratum of *Allocasuarina* beneath Eucalyptus, Corymbia or Angophora. Glossy black-cockatoos have also been observed in mixed Allocasuarina, Casuarina, cypress Callitris and brigalow *Acacia harpophylla* woodland assemblages. Potential habitat for the Glossy Black-cockatoo as open sclerophyll forests and woodlands with a stratum of *Allocasuarina* sp. beneath *Eucalyptus, Corymbia* or *Angophora*, occur within and adjacent to the New Beith Road reserve, within Category B (remnant) vegetation. However, the site is currently subject to significant fragmentation to the north with existing residential development. Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment potential habitat within the existing road reserve. In the wider landscape, significant fragmentation currently exists to the north and east, with residential development and major railway infrastructure in these areas. Land clearing and ongoing vehicle disturbance on land to the west and south of the road reserve further fragments potential habitat onsite.

Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by the species. Given the higher quality intact bushland vegetation to the west, it is likely the species would preferentially forage in these areas rather than the highly disturbed and modified road reserve. The closest record of the species occurs approximately 4 km from the subject site, more abundant records are found within pockets of vegetation to the east, west and north outside of the impact are and buffer (**Plan A13**). As the referral area is surrounded by land that will be impacted by future residential development and lack of evidence of the species onsite, removal of the potential habitat is unlikely to fragment any existing populations.

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

Assessment: The Significant Impact Guidelines provide the following definition for 'habitat critical to the survival of a species'. "Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- For activities such as foraging, breeding, roosting or dispersal
- For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)

- To maintain genetic diversity and long-term evolutionary development
- For the reintroduction of populations or recovery of the species or ecological community.

Responses to the definition of habitat critical to the survival of a species' follows below:

- The referral site shows no evidence of current Glossy Black-cockatoo usage and will not be accessible for Glossy Black-cockatoo to use for foraging, breeding, roosting or dispersing as a result of the development within the Greater Flagstone Development Area existing fragmenting factors on all sides.
- The vegetation on the referral site is not required for the long-term maintenance of the species as there is higher quality retained bushland vegetation to the west of the referral area which is likely to be preferentially selected by the species (**Plan A12**).
- Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by the Glossy Black-cockatoo. The referral area is therefore unlikely to contribute to genetic diversity of the species.
- The referral area will be isolated from other habitat following the development of surrounding residential areas. In addition, significant current threats exist within and surrounding the referral area including wild dogs, vehicle use, weed encroachment, illegal offroad vehicle use and the train line further east. The referral site is not considered suitable for the reintroduction of Glossy Black-cockatoo nor will it be able to aid in the recovery of the species.

The referral site is, therefore, not considered to be critical to the survival of the species.

5. Disrupt the breeding cycle of an important population

Assessment: While there is potential habitat in the form of *Allocasuarina littoralis* present within the referral area, detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by the species. It is not considered that the proposed action would disrupt the breeding cycle of a population of Glossy Black-cockatoo as there is a lack of indication of breeding population on-site. Therefore, the removal of the potential habitat in the relatively small area of the referral site is unlikely to disrupt the breeding cycle of the population.

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: Field surveys located scattered isolated black sheoak (*Allocasuarina littoralis*) in areas of the remnant vegetation adjacent to and within the New Beith Road reserve. In addition, vegetation within the Category X area at the northern extent of the road reserve contains an understorey of *A. littoralis* on the western side.

However, the referral site is subject to significant disturbance in the form of vehicle use and damage, logging, rubbish dumping, invasive fauna species and weed incursion where habitat throughout the site is considered low quality in some areas. Weed disturbance is

high throughout the *A. littoralis* areas, with *Lantana camara* (Lantana), *Ageratum houstonianum* (Blue Billy Goat), and *Paspalum dilatatum* (Paspalum) dominating the ground and shrub layers. Searches of these habitat areas did not identify any feeding "orts" within *Allocasuarina littoralis* stands characteristic of Glossy Black-cockatoo. Substantial clearing has occurred within the northern and central extents of the road reserve, and on adjacent land to the west. In this area, vehicle disturbance is common among other illegal uses.

Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by Glossy Black-cockatoo. It is unlikely this area provides suitable habitat for the species, given the presence of intact higher quality vegetation in the broader landscape, in particular in bushland to the west of the site (**Plan A12**). Glossy Black-cockatoo have been recorded west of the site but as the referral area does not show evidence of Glossy Black-cockatoo utilising the site, it is not considered that the proposed action will impact the habitat on-site to the extent that the species is likely to decline.

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

Assessment: The road reserve currently contains species including Wild Dog, Feral Pig and *Lantana camara* (Lantana) that degrade the habitat quality of the Glossy Black-cockatoo. Given the existing threats present onsite, the road upgrade is unlikely to cause further impact from invasive species. However, measures will be put in place during construction for the road upgrade in order to minimize the introduction of invasive species that are harmful to the Glossy Black-cockatoo or Glossy Black-cockatoo habitat.

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

Assessment: The proposed action is unlikely to introduce disease that may cause the species to decline. While field surveys located scattered isolated black sheoak (*Allocasuarina littoralis*) within the referral area, this habitat was considered of low quality and subject to high levels of disturbance. Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by Glossy Black-cockatoo therefore risk of disease to the species occurring is unlikely to occur.

9. Interfere substantially with the recovery of the species.

Assessment: Detailed studies did not detect any evidence of Glossy Black-cockatoo within the referral area, suggesting the vegetation on-site is not utilised by the species. Glossy Black-cockatoo records are evident in vegetation to the west of the referral area which are to be retained. However, vegetation directly surrounding the road reserve is to be largely cleared as part of development within the Greater Flagstone PDA. Once vegetation within these areas are cleared, the referral area will be isolated from other potential habitat. The referral site is not suitable for the reintroduction of Glossy Black-cockatoo nor will it be able to aid in the recovery of the species.

Summary

Although a significant impact is not considered likely, potential foraging and denning habitat for the Glossy Black-cockatoo will be cleared under the proposal. Therefore an impact assessment has been completed.

Glossy Black-cockatoo Impact Assessment

The proposed action will be entirely located within the referral area and will require the removal of 0.35 ha of vegetation considered potential foraging habitat for the Glossy Black-cockatoo (refer **Plan A35**). In this case the foliage cover of all *Allocasuarina* and *Casuarina* trees over 100 mm DBH was mapped within the impact area to represent potential foraging habitat for the species. A total of 158 medium and large hollows will be directly impacted under the proposal (**Plan A35**). Despite the presence of 158 potentially suitable hollows for the species, it is considered unlikely that the Glossy Black-cockatoo would utilise the site as there is relatively limited (only 0.35 ha) potential foraging habitat on or surrounding the area. The Conservation Advice for *Calyptorhynchus lathami lathami* (south-eastern glossy black-cockatoo) considers that the species nests close to, or within, foraging habitat. As there is relatively limited foraging habitat present for the species on site it is considered unlikely that suitable hollows will be used for nesting by the species. Additionally, as there are limited nearby historical records for the species, it is considered unlikely that the proposed action will have a significant impact on the Glossy Black-cockatoo.

A35. GLOSSY BLACK-COCKATOO IMPACTS

Inset 1. (1:3,000)

Inset 2. (1:5,000)

Inset 3. (1:1,000)

Inset 1.

Inset 2.

Inset 3.

27°46'0"S

27°47'0"S

152°56'0"E

© Nearmap

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

Layer Sources

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

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Updated data available at

http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- Qld DCDB
- Referral Area
- Existing cleared track

Engineering Detail

- Road Design
- Batters

GBC Foraging Habitat Impact

- *Assessment Unit 1:* GBC foraging habitat impacted [0.28 ha]
- *Assessment Unit 2:* GBC foraging habitat impacted [0.06 ha]
- *Assessment Unit 3:* GBC foraging habitat impacted [0.01 ha]

Hollow Tree Plot

- Tree with medium hollows (total medium hollows impacted: 44)
- Tree with large hollows (total large hollows impacted: 114)

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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15/10/2025

8418 E A35 NBR Impact GBC A

4.5.4. Swift Parrot (Lathamus discolor)

To determine whether the proposed action is likely to have a significant impact on the Swift Parrot, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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

Assessment: The New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature *Eucalyptus* sp., *Acacia* sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

The site is not dominated by preferred breeding habitat tree species, Blue Gum (*Eucalyptus globulus*) and does not contain non-breeding habitat in the form of inland box-ironbark and grassy woodlands, and coastal swamp mahogany (*E. robusta*) and southern spotted gum (*Corymbia maculata*) woodland. The species was not identified on-site nor as fly-over during field survey effort. In addition, there are no recent records of the species within 5km or 10km of the subject site within the last 20years on the ALA Database (**Plan A15**).

It is unlikely a population of this species is using vegetation onsite for breeding or roosting, as there is substantially higher quality available habitat to the west of the road reserve and preferred tree species are not present onsite. Given the high mobility capacity of the species, and abundance of preferential habitat in the wider locality, the significance of foraging habitat on-site is considered marginal at best. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Swift Parrot populations in the area.

2. Reduce the area of occupancy of the species

Assessment: The Swift Parrot breeds in Tasmania during spring to early summer and migrates to the mainland during autumn and winter to forage. Large portions of the referral area are mapped as Category X (non-remnant) under the Queensland Vegetation Management Act 1999 where high levels of disturbance occur throughout the road reserve. There are no records of the species within 5 km of the site on ALA. Suitable foraging habitat may be present onsite, although higher quality habitat is present within the broader landscape, particularly large intact bushland to the west of the referral area (**Plan A14**).

Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Swift Parrot within the referral area, suggesting the vegetation on-site is not utilised by Swift Parrots. No evidence of Swift Parrot activity was recorded on-site. Surrounding impact from earmarked development is likely to restrict the extent of available habitat onsite and connectivity to the referral area will be largely isolated from other

habitat. Given the higher quality habitat to the west of the referral area and significant disturbance onsite from vehicle usage, it is unlikely the species is utilising vegetation onsite for breeding or roosting. Therefore, due to the above considerations combined it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Swift Parrot.

3. Fragment an existing population into two or more

Assessment: The site is currently subject to significant fragmentation to the north with existing residential development. Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment potential habitat within the existing road reserve. In the wider landscape, significant fragmentation currently exists to the north and east, with residential development and major railway infrastructure in these areas. Land clearing and ongoing vehicle disturbance on land to the west and south of the road reserve further fragments potential habitat onsite.

The species was not identified on-site during extensive field survey. Given the mobility of Swift Parrot, and the presence of higher quality intact bushland to the west it is considered this vegetation would be utilised for foraging preferentially. In addition to the narrow linear impact area is unlikely to contribute significantly to existing fragmentation.

The action will not fragment an existing population into two or more. Online databases show no records of the species within 5 km of the referral area. As the referral area is surrounded by land that will be impacted by future residential development and lack of evidence of the species onsite, the removal of the potential habitat is unlikely to fragment any existing populations. 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 Significant Impact Guidelines provide the following definition *for 'habitat critical to the survival of a species'. "Habitat critical to the survival of a species or ecological community'* refers to areas that are necessary:

- *For activities such as foraging, breeding, roosting or dispersal*
- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)*
- *To maintain genetic diversity and long-term evolutionary development*
- *For the reintroduction of populations or recovery of the species or ecological community.*

Responses to the definition of habitat critical to the survival of a species' follows below:

- The referral site shows no evidence of current Swift Parrot usage and will not be accessible for Swift Parrot to use for foraging, breeding, roosting or dispersing as a result of the development within the Greater Flagstone Development Area existing fragmenting factors on all sides.

- The vegetation on the referral site is not required for the long-term maintenance of the species as there is higher quality retained bushland vegetation to the west of the referral area which is likely to be preferentially selected by the species.
- Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Swift Parrot within the referral area, suggesting the vegetation on-site is not utilised by the Swift Parrot. The referral area is therefore unlikely to contribute to genetic diversity of the species.
- The referral area will be isolated from other habitat following the development of surrounding residential areas. The referral area forms part of the Flagstone City development area which will consist of future residential areas. In addition, significant current threats exist within and surrounding the referral area including wild dogs, vehicle use, weed encroachment, illegal offroad vehicle use and the train line further east. The referral site is not considered suitable for the reintroduction of Swift Parrot nor will it be able to aid in the recovery of the species.

  Notably, the recovery plan states that habitat critical to the survival of the Swift Parrot includes all preferred foraging species within known and likely foraging habitat on the mainland. As the site maintains potential foraging resources for the species that will be impacted, a significant impact may occur.

5. Disrupt the breeding cycle of a population

Assessment: Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Swift Parrot within the referral area, suggesting the vegetation on-site is not utilised by the species. It is not considered that the proposed action would disrupt the breeding cycle of a population as the Swift Parrot breeds 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. Therefore, the removal of the potential habitat in the relatively small area of the referral site is unlikely to disrupt the breeding cycle of the population.

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 referral site is subject to significant disturbance in the form of vehicle use and damage, logging, rubbish dumping, invasive fauna species and weed incursion where habitat throughout the site is considered low quality in some areas. The preferred breeding habitat featuring Blue Gum (*Eucalyptus globulus*) is not present onsite nor is non-breeding habitat in the form of inland box-ironbark and grassy woodlands, and coastal swamp mahogany (*E. robusta*) and southern spotted gum (*Corymbia maculata*) woodland. Field survey methods did not detect any evidence of Swift Parrot within the referral area, suggesting the vegetation on-site is not utilised by Swift Parrot. It is unlikely this area provides suitable habitat for the species, given the presence of intact higher quality vegetation in the broader landscape, in particular in bushland to the west of the site (**Plan A14**). Swift Parrot have not been recorded on online databases within 5 km of the referral site therefore it is not

considered that the proposed action will impact the habitat on-site to the extent that the species is likely to decline (**Plan A15**).

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

Assessment: Currently, the invasive species with the greatest impacts on the Swift Parrot include the European Honeybee (*Apis mellifera*) and Large Earth Bumblebee (*Bombus terrestris*) due to competition with the Swift Parrot for foraging resources. Also, the European Honeybee and European Starling (*Sturnus vulgaris*) are known to compete with the Swift Parrot for nest hollows. Native species such as the Noisy Miner (*Manorina melanocephala*) and Rainbow Lorikeet (*Trichoglossus moluccanus*) are known aggressors to Swift Parrots. The road reserve also currently contains species including Wild Dog, Feral Pig and *Lantana camara* (Lantana) that degrade the habitat quality of the Swift Parrot.

Given the existing threats present onsite, the road upgrade is unlikely to cause further impact from invasive species. However, measures will be put in place during construction for the road upgrade in order to minimize the introduction of invasive species that are harmful to the Swift Parrot or Swift Parrot habitat. 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: Psittacine Beak and Feather Disease is a potentially deadly disease for parrot species and is continuously present in wild parrot populations. This disease is currently known to occur within SEQ and areas within the distribution of the Swift Parrot. The disease is spread through wild populations of parrots through natural processes and is fatal to an individual when contracted.

In consideration to the transmission process of this disease, being from parrot to parrot in the wild through spread of faeces and other bodily processes, the proposed action is not considered likely to increase the potential for this disease to occur.

As such, 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. Further, preferential habitat exists in the wider locality within larger tracts of intact remnant vegetation located at White Rock-Spring Mountain Conservation Park with Flinders-Goolman Conservation estate to the south-west.

Detailed studies did not detect any evidence of Swift Parrot within the referral area, suggesting the vegetation on-site is not utilised by the species. Vegetation directly

surrounding the road reserve is to be largely cleared as part of development within the Greater Flagstone PDA. Once vegetation within these areas are cleared, the referral area will be isolated from other potential habitat. The referral site is not suitable for the reintroduction of Swift Parrot nor will it be able to aid in the recovery of the species.

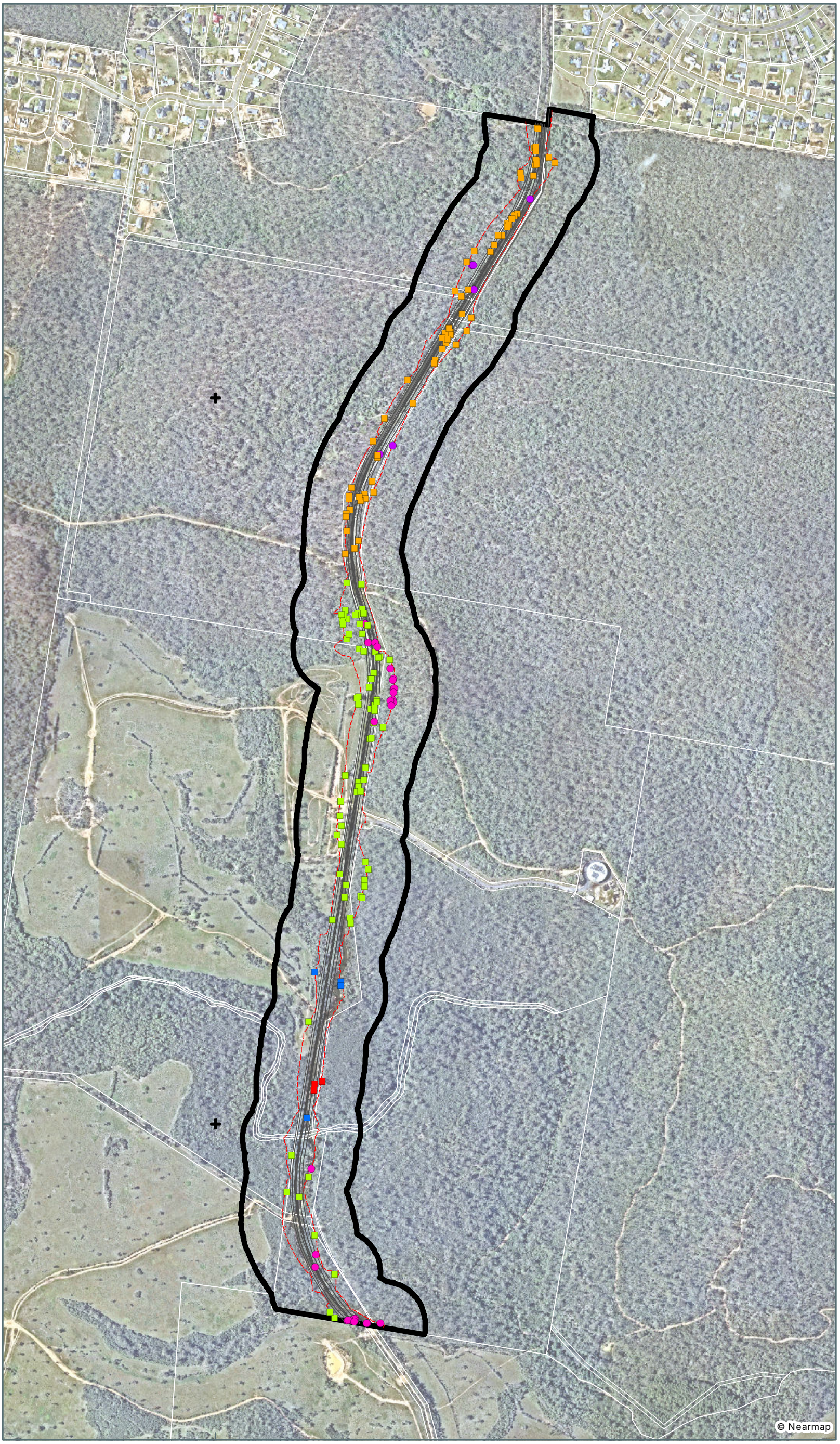
Summary

Potential foraging habitat for the Swift Parrot will be cleared under the proposal. Therefore an impact assessment has been completed.

Swift Parrot Impact Assessment

The proposed action will be entirely located within the referral area and will require the removal of 187 key foraging specimens for the Swift Parrot as per the Conservation Advice, being plotted *Eucalyptus tereticornis* (154) and *Corymbia citriodora* (33) over 300 mm DBH (refer **Plan A36**).

A36. SWIFT PARROT IMPACTS



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Layer Sources

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

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LEGEND

- Qld DCDB
- Referral Area
- Existing cleared track

Engineering Detail

Layer

- Road Design
- Batters

Impacted Trees within Assessment Units

- Corymbia citriodora with a DBH ≥300mm impacted within Assessment Unit 1 [6]
- Corymbia citriodora with a DBH ≥300mm impacted within Assessment Unit 2 [27]
- Eucalyptus tereticornis with a DBH ≥300mm impacted within Assessment Unit 1 [71]
- Eucalyptus tereticornis with a DBH ≥300mm impacted within Assessment Unit 2 [76]
- Eucalyptus tereticornis with a DBH ≥300mm impacted within Assessment Unit 3 [4]
- Eucalyptus tereticornis with a DBH ≥300mm impacted within Assessment Unit 4 [3]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

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8418 E A36 NBR Impact SP A

4.5.5. Regent Honeyeater (*Anthochaera phrygia*)

The Regent Honeyeater is listed as Critically Endangered under the EPBC Act effective from 8th July 2015. The Federal Significant Impact Guidelines are to be utilised to determine if a significant impact on Regent Honeyeater may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches.

To determine whether or not the proposed action is likely to have a significant impact on the Regent Honeyeater, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided. The results of this assessment determined that a significant impact on the Regent Honeyeater is not likely.

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 is to be viewed in conjunction with this assessment. 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 New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature eucalypt sp., *Acacia* sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

The site is not dominated by box and ironbark eucalypts which is the preferred forest type of this species, although *Eucalyptus siderophloia* (Grey Ironbark) was recorded during field

surveys. Mistletoe species were observed within the referral area but predominately associated with *Alphitonia excelsa* (Soap Tree) and were sparse.

No evidence of the Regent Honeyeater was observed during detailed field surveys. Bushland west of the site shows a record in 2019 of the Regent Honeyeater within 5 km of the referral area according to Atlas of Living Australia (ALA) (**Plan A17**). It is unlikely a population of this species is using vegetation onsite for breeding or roosting, as there is substantially higher quality available habitat to the west of the road reserve. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Regent Honeyeater populations in the area.

2. Reduce the area of occupancy of the species

Assessment: The preferred Box-Ironbark Eucalypt woodland habitat for Regent Honeyeaters was not present onsite. Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Regent Honeyeater within the referral area, suggesting the vegetation on-site is not utilised by Regent Honeyeaters. No evidence of Regent Honeyeater activity was recorded on-site. Surrounding impact from earmarked development is likely to restrict the connectivity of available habitat onsite and increase disturbance. Given the higher quality habitat to the west of the referral area and significant disturbance onsite from vehicle usage, it is unlikely the species is utilising vegetation onsite for breeding or roosting. Therefore, due to the above considerations combined it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Regent Honeyeaters.

3. Fragment an existing population into two or more

Assessment: The site is currently subject to significant fragmentation to the north with existing residential development. Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment potential habitat within the existing road reserve (**Plan A3**). In the wider landscape, significant fragmentation currently exists to the north and east, with residential development and major railway infrastructure in these areas. Land clearing and ongoing vehicle disturbance on land to the west and south of the road reserve further fragments potential habitat onsite.

The species was not identified on-site during extensive field survey within the impact and buffer area, suggesting the vegetation on-site is not utilised by the species. Given the higher quality intact bushland vegetation to the west, it is likely the species would preferentially forage in these areas rather than the highly disturbed and modified road reserve. Online databases show One (1) record of Regent Honeyeater within 5 km south-west of the referral area from 2019 within intact bushland vegetation (**Plan A17**).

Due to the future adjacent developments, onsite disturbances and lack of records in proximity to the impact area and more favourable, high quality vegetation offsite, the removal of the habitat as part of the action is unlikely to fragment any existing populations.

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 (**Plan A16**). The site is not dominated by box and ironbark eucalypts which is the preferred forest type of this species, although *Eucalyptus siderophloia* (Grey Ironbark) was recorded during field surveys. Mistletoe species were observed within the referral area but predominately associated with *Alphitonia excelsa* (Soap Tree) and were sparse. This habitat is not recognised as being critical to the survival of the species due to the limited preferable habitat species and the levels of historical and ongoing modification across the proposed impact area. The linear impact for the road is not expected to significantly exacerbate the existing breaks in the potential foraging canopy.

Notably, the recovery plan states that habitat critical to the survival of the Regent Honeyeater includes any breeding or foraging areas where the species is likely to occur. As the site maintains potential foraging resources for the species that will be impacted, a significant impact may occur.

5. Disrupt the breeding cycle of a population

Assessment: The Regent Honeyeater typically breeds during spring and summer, from August to February, with several areas in NSW and Victoria well known to support breeding pairs during this time. The species typically migrates towards south-east Queensland during the non-breeding season, predominantly staying close to or west of the Great Dividing Range, but intermittently occurring throughout areas of south-east Queensland east of the range.

The Regent Honeyeater was not observed on-site during extensive field survey effort across multiple years. Further, no evidence of breeding was observed on-site in addition to the site being located several hundred kilometres from known breeding areas. 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 species was not identified on-site during field survey events; however, some potential foraging habitat was noted within the referral area. A number of factors reduce the suitability of this site as potential foraging habitat. The site is not dominated by box and ironbark eucalypts which is the preferred forest type of this species, although *Eucalyptus siderophloia* (Grey Ironbark) was recorded during field surveys. Mistletoe species were observed within the referral area but predominately associated with *Alphitonia excelsa* (Soap Tree) and were sparse. Due to historical disturbances, preferred large diameter eucalypts are limited across the referral area, reducing the availability of preferred habitat on-site. Additionally, Regent Honeyeaters are known to be outcompeted by aggressive birds such as the Noisy Miner (*Manorina melanocephala*), a species which was observed utilising the vegetation on-site.

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

Assessment: Presently, the invasive species with the highest impact on the Regent Honeyeater is the European Honeybee (*Apis mellifera*), with additional known impacts from the native but known aggressor, the noisy miner (*Manorina melanocephala*). Colonies of the European Honeybee are known to compete with Regent Honeyeaters in critical habitat for nectar, with the full impacts of this competition currently unknown. This competitive interaction is listed as a Threatening Process under NSW and Victoria legislation. Noisy miners, despite being native to Australia and south-east Queensland, are known aggressors towards numerous bird species including the Regent Honeyeater. This interaction is listed as a Threatening Process under the EPBC Act and is considered to impact on both breeding and foraging of the Regent Honeyeater, potentially impacting the species overall survival rate.

These species are currently present within the local area and extended region and are unlikely to increase in abundance due to the proposed action. As such no significant impact resulting in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat is considered to result from the proposed action.

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

Assessment: At present, no diseases are known to significantly impact on the species in the wild, with any concern relating to disease within the captive bred populations.

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 relatively narrow impact site likely to have limited impact to aerial species. Hence, no significant impact is considered to result from the proposed action.

Summary

Potential foraging habitat for the Regent Honeyeater will be cleared under the proposal. Therefore an impact assessment has been completed.

Regent Honeyeater Impact Assessment

The proposed action will be entirely located within the referral area and will require the removal of 33 key foraging specimens for the Regent Honeyeater as per the conservation advice, being plotted *Corymbia citriodora* over 300 mm DBH (refer **Plan A37**).

A37. REGENT HONEYEATER IMPACTS

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

Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/
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LEGEND

- Qld DCDB
- Referral Area [90.4 ha]
- Existing cleared track

Engineering Detail

- Road Design
- Batters

Impacted Trees within Assessment Units

- Corymbia citriodora with a DBH ≥300mm impacted within Assessment Unit 1 [6]
- Corymbia citriodora with a DBH ≥300mm impacted within Assessment Unit 2 [27]

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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15/10/2025

8418 E A37 NBR Impact RH A

4.5.6. Yellow-bellied Glider (Petaurus australis australis)

Assessment against the Significant Impact Guidelines 1.1 for the Yellow-bellied Glider

EPBC Act, Yellow-Bellied Glider populations are listed as Vulnerable, effective from 20 March 2024. The species is listed under Queensland Nature Conservation Act 1992 (Qld) (NCA) as Vulnerable. As such, the Federal Significant Impact Guidelines can be utilised to determine if a significant impact on Yellow-bellied Glider may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches. Frequent and intense bushfires, inappropriate prescribed burning, climate change, land clearing and timber harvesting are key threats to the Yellow-bellied Glider, where loss and fragmentation of habitat has already occurred in many areas of the species range.

To determine whether the proposed action is likely to have a significant impact on the Yellow-bellied Glider, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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

Assessment: The Yellow-bellied Glider is mostly restricted to eucalypt forests and woodlands, although it occurs in highest abundance in taller, montane, moist eucalypt forests with abundant (large) hollow-bearing trees for shelter and a variety of eucalypt species for feeding. A variety of eucalypt species occur within and adjacent to the New Beith Road reserve, however some areas of Category X vegetation are highly disturbed and represent historical clearing with only scattered mature trees remaining. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature *Eucalyptus* sp., *Acacia* sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas (see **Section 3.4.12** for more detail). The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from vehicle use.

No evidence of Yellow-bellied Glider was observed during targeted field surveys onsite. Given they are highly susceptible to existing disturbance the existing road use and increase in development within the Greater Flagstone PDA it is considered unlikely an important population of Yellow-bellied Glider occupies vegetation within or adjacent to the impact site. Once vegetation on surrounding areas as part of the Greater Flagstone area have been cleared, there will be limited connectivity to the referral area and adjoining vegetation to the west, aside from retained waterway areas throughout the road reserve (**Plan A18**). The proposed action is unlikely to reduce the size of the population because the site will be fragmented as a result of surrounding development and does not currently display evidence of Yellow-bellied Glider usage. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Yellow-bellied Glider populations in the area.

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

Assessment: Field surveys confirmed the presence of hollow bearing trees within the road reserve and scattered within adjacent remnant bushland. No individuals were recorded during field surveys. Observations of this species exclusively to the north of site in pockets of vegetation amongst residential developments (**Plan A19**). Records are also observed north of site adjacent to Greenbank Military Training area and to the west in the contiguous patch of vegetation.

Due to the high disturbance from vehicles, other illegal uses, and the modification of surrounding habitat it is considered poor quality habitat for the species.

In addition, surrounding impact from earmarked development is likely to restrict the extent of habitat for Yellow-bellied Glider and connectivity to the referral area will be largely isolated from other Yellow-bellied Glider habitat (**Plan A18**). While the proposed action will remove potential Yellow-bellied Glider habitat, the impact is focused on a site that will be inaccessible to Yellow-bellied Glider and adjoin a major road and residential development. Therefore, due to the above considerations it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Yellow-bellied Gliders.

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

Assessment: The site is currently subject to significant fragmentation to the north with existing residential development. Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment Yellow-bellied Glider habitat within the existing road reserve. In the wider landscape, significant fragmentation currently exists to the north and east, with residential development and major railway infrastructure in these areas. Land clearing and ongoing vehicle disturbance on land to the west and south of the road reserve further fragments potential habitat onsite.

Field surveys confirmed the presence of hollow bearing trees within the road reserve and scattered within adjacent remnant bushland. No individuals were recorded during field surveys. Due to the high disturbance with vehicle use and other illegal uses, and the modification of surrounding habitat it is considered poor quality habitat for the Yellow-bellied Glider. Connectivity to vegetation is limited with residential areas to the north and cleared modified areas in the south and southwest. Vegetation associated with Flagstone Creek remains a form of connectivity from vegetation in the east to larger intact bushland in the west, however, is currently fragmented due to the existing cleared road.

Online databases show Yellow-bellied Glider presence within 10 km of the site, towards the north and the west (**Plan A19**). However, these records occur amongst and adjacent to existing residential developments. This indicates significant barriers exist between existing populations and the impact site, therefore it is unlikely this population would utilised the site.

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

Assessment: The Significant Impact Guidelines provide the following definition for 'habitat critical to the survival of a species'. *"Habitat critical to the survival of a species or ecological community*' refers to areas that are necessary:

- *For activities such as foraging, breeding, roosting or dispersal*
- *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)*
- *To maintain genetic diversity and long-term evolutionary development*
- *For the reintroduction of populations or recovery of the species or ecological community.*

Responses to the definition of habitat critical to the survival of a species' follows below:

- The referral site shows no evidence of current Yellow-bellied Glider usage. The vegetation on site contains some habitat values in the form of hollow bearing trees however higher quality habitat further from disturbances occurs west of site which contains greater connectivity in the broader landscape and offers more preferential habitat for foraging, breeding, roosting and dispersal.
- Substantial clearing has occurred within the northern and central extents of the road reserve, and on adjacent land to the west. In this area, vehicle disturbance is common among other illegal uses. However, throughout the road reserve, large mature hollow-bearing trees remain which provide potential habitat for the Yellow-bellied Glider. Due to fragmentation to the adjacent bushland, high disturbance levels and a lack of local records, it is considered a low likelihood that these hollow-bearing trees are being utilised by Yellow-bellied Glider.
- Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Yellow-bellied Glider within the referral area, suggesting the vegetation on-site is not utilised by Yellow-bellied Glider. The referral area is therefore unlikely to contribute to genetic diversity of the species.
- The referral area will be isolated from other Yellow-bellied Glider habitat onsite following the development of surrounding residential areas. The referral area forms part of the Flagstone City development area which will consist of future residential areas. In addition, significant current threats exist within and surrounding the referral area including wild dogs, vehicle use, weed encroachment, illegal offroad vehicle use and the train line further east. The referral site is not considered suitable for the reintroduction of Yellow-bellied Glider.

Notably, the vegetation on site meets the criteria listed in the Conservation Advice, being a large contiguous area of floristically diverse eucalypt forest that is dominated by winter-flowering and smooth-barked eucalyptus, including mature living hollow-bearing trees and sap trees, so is therefore considered to be habitat critical to the survival of the species. This means there is likely to be a significant impact to the Yellow-Bellied Glider as a result of the action as per the Conservation Advice.

5. Disrupt the breeding cycle of an important population.

Assessment: Noting the species is readily detected via spotlighting surveys, detailed studies utilising both direct and indirect survey methods did not detect any evidence of Yellow-bellied Glider within the referral area, suggesting the vegetation on-site is not utilised by Yellow-

bellied Glider. It is not considered that the proposed action would disrupt the breeding cycle of a population of Yellow-bellied Glider as there is a lack of indication of breeding population on-site. Yellow-bellied Glider do not have specific habitat requirements of breeding and the removal of the potential habitat in the relatively small area of the referral site is unlikely to disrupt the breeding cycle of the population. Further, connectivity will be facilitated by the provision of best-practice fauna passage (**Plan A32**).

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 referral area is subject to significant disturbance and modification from clearing, offroad vehicle use and rubbish dumping. Further, the road easement includes existing power lines that lead to the reservoir on top of Round Mountain that present a potential additional fragmenting factor and threat. It is unlikely that Yellow-bellied Glider are utilising the hollow-bearing trees onsite as these are fragmented from the existing bushland and there was no evidence of Yellow-bellied Glider detected onsite. It is not considered that the proposed action will impact the habitat on-site to the extent that the species is likely to decline.

   As there is no evidence that Yellow-bellied Glider is present on-site, and the site is not conducive for dispersal or long-term presence on the site due to the high level of fragmentation, it is unlikely that the proposed development will result in the decline of the species.

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

   Assessment: Invasive species such the feral cat (*Felis catus*) and Dogs (*Canis lupus familiaris*) are identified as threats to the species. 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 Yellow-bellied 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 Yellow-bellied Glider. However, conservation and recovery actions are listed in the *Petauroides australis australis (yellow-bellied glider (south-eastern)) Conservation Advice* (DCCEEW, 2022). Management priorities involve limiting habitat loss, disturbance and fragmentation, reducing mortality within areas known to contain Yellow-bellied glider and removal of hollow-bearing trees and implementing measures to limit the occurrence of wildfires in known habitat.

Detailed studies did not detect any evidence of Yellow-bellied Glider within the referral area, suggesting the vegetation on-site is not utilised by the species. In addition, surrounding vegetation falls within the Greater Flagstone PDA which are earmarked for development. Once vegetation within these areas are cleared, the referral area will be isolated from other Yellow-bellied Glider habitat (**Plan A18**). The referral site is not suitable for the reintroduction of Yellow-bellied Glider nor will it be able to aid in the recovery of the species.

Summary

Potential foraging and denning habitat for the Yellow-bellied Glider will be cleared under the proposal, and the road upgrade has potential to indirectly impact on potential habitat within 100 m. Therefore an impact assessment has been completed.

Yellow-bellied Glider Impact Assessment

The proposed action will be entirely located within the referral area and will require the removal of 16.8 ha of vegetation considered potential habitat for the Yellow-bellied Glider, and taking into consideration 100 m buffers to existing development as per the Conservation Advice, an additional 58.5 ha of potential Yellow-bellied Glider habitat will be indirectly impacted, making a total impact area of 75.3 ha (refer **Plan A37**).

A total of 204 medium and large hollows will be directly and indirectly impacted under the proposal (**Plan A37**). The features based assessment to cater for Yellow-bellied Glider denning and breeding habitat relies on hollow counts plus an error margin of 20% for field surveys as justified for hollow counts applied in the Greater Glider assessment.

To accurately assesses the impacts on Yellow-bellied Glider both an area-based assessment using species specific MHQA and features-based assessment for lost denning hollows has been applied. Notably, the features-based assessment for lost hollows will be utilised to ensure that like for like denning and shelter attributes can be provided at the proposed offset site.

Yellow-bellied Glider Habitat - Modified Habitat Quality Assessment Tool

The subject site has been assessed using a modified version of the Queensland State Governments "Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy" Version 1.2 April 2017. The purpose of this guideline is to provide a methodology for proponents to determine the habitat quality of a site under the Queensland Environmental Offsets framework. The guideline is a step-by-step methodology explaining how to measure habitat quality for land-based offsets. This methodology has been adopted and tailored/modified to assess the impacts and offsets relating to Matters of National Environmental Significance (MNES).

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

For the spatial analysis, the modified habitat quality assessment (MHQA) combines the three (3) key indicators from the Queensland State Government guide into two (2) (site condition and site context) with each being weighted 30% of the final score. The balance of the weighting, 40%, has been attributed to the third indicator

(species stocking rate), that is independent of the Queensland State Government habitat quality assessment. The species stocking rate has been added to the MHQA to better incorporate MNES, and specifically the vulnerable Yellow-bellied Glider. The following subsections detail the methodology utilised to assess the site condition, site context and species stocking rate under the MHQA.

The features based assessment to cater for Yellow-bellied Glider denning and breeding habitat relies on hollow counts plus an error margin of 20% for field surveys based on relevant literature.

Site Condition (30%)

The site condition assessment under the MHQA is assessed using 15 condition characteristics being:

- recruitment of woody perennial species in EDL;
- native plant species richness – trees;
- native plant species richness – shrubs;
- native plant species richness – grasses;
- native plant species richness – forbs;
- tree canopy height;
- sub-canopy cover;
- tree canopy cover;
- native grass cover;
- organic litter;
- large trees;
- coarse woody debris;
- non-native plant cover;
- quality and availability of food and foraging habitat; and
- quality and availability of shelters.

Assessment of the above condition characteristics do not differ from the traditional habitat quality assessment. Scoring tables for the site condition attributes follows the scoring tables within the BioCondition manual (refer above). In developing the MHQA to better incorporate MNES, two (2) species habitat index characteristics, being, (1) quality and availability of food and foraging habitat, and (2) quality and availability of shelter have been added to the site condition indicator. The quality and availability of food and foraging habitat index attributes are based on the site condition features that relate to the presence of canopy in the ecologically dominant layer where the species feeds scored as a proportion against the T1 tree canopy cover benchmark, where <33% of the expected benchmark scores 1, 33% to 66% scores 5, and >66% scores 10. The T1 canopy cover is considered a suitable metric for foraging habitat given the size class includes only the T1 dominant layer and all Regional Ecosystems contain Yellow-bellied Glider foraging species within the ecologically dominant layer according to the relevant Regional Ecosystem technical descriptions. The quality and availability of shelter habitat index attributes are based on hollow counts per hectare plus an error margin of 20% based on relevant literature relative to expectations (i.e. 2 to 4 hollows per 2 ha), where <1 hollow per ha scores 1, 1 to 2 hollows per ha scores 5, and greater than 2 hollows per ha scores 10. Refer **Plan A39** for hollow counts per assessment unit.

As the Yellow-bellied Glider is most reliant upon upper tree canopy for foraging and hollows for shelter than other ecosystem attributes, the overall Site Condition score has been additionally weighted 40% for the traditional condition attributes (species richness etc.), 20% for quality of foraging habitat and 40% for quality of shelter habitat.

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 habitat areas and State mapped ecological corridors. Under the MHQA, site context is measured using the following seven characteristics:

- size of patch (refer **Plan A39**);
- connectedness (refer **Plan A39**)
- context (refer **Plan A39**)
- State mapped ecological corridors (refer Plan **A29**);
- role of site location to species overall population in the state;
- threats to the species; and
- species mobility capacity.

Unlike the traditional habitat quality assessment methodology where site connectedness is assessed against the surrounding remnant vegetation only, the MHQA site connectedness is assessed against the surrounding MNES habitat, in this instance, Yellow-bellied Glider habitat as mapped by the State.

Assessment methodology for site context assessment for Yellow-bellied Glider is outlined below:

1. patch size – The calculation of the area of the patch size uses the method outlined in the Biocondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors.
2. connectedness – Connectivity relates to the capacity that the species have to disperse through the landscape. The attribute is calculated using GIS by measuring the length of habitat that is along the boundary of the site.
3. context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. The attribute is measure of the percentage of habitat within a 1 km buffer of the site.
4. State mapped ecological corridors – This attribute is as per the methods of the *Guide to determining terrestrial habitat quality V1.2* and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the

landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, this is not their primary function when assessing the attribute. The ecological corridors have been mapped by the Queensland State Government under the 'CORR_TYPE' attribute table. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer.

5. 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.

6. Threats to species – Threats to Yellow-bellied Glider are predominantly habitat loss, timber harvesting, feral predator attack, barbed wire and uncontrolled bushfire. A risk matrix relative to the conservation advice for the Greater Glider was applied to determine threats to species:

    - Habitat loss is considered Very High Risk under the Yellow-bellied Glider conservation advice. Clearing and fragmentation 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 Yellow-bellied Glider 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).
    - Timber harvesting is considered Very High Risk under the Yellow-bellied Glider conservation advice. Timber harvesting is scored Low, Moderate and High relative to the implementation and frequency of timber harvesting and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Feral Cat attack is considered Low Risk under the Yellow-bellied Glider conservation advice. Feral Cat attack is scored Low, Moderate and High relative to the presence of Feral Cats and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Fox attack is considered Low Risk under the Yellow-bellied Glider conservation advice. Fox attack is scored Low, Moderate and High relative to the presence of Foxes and level of cover available and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).
    - Barbed wire entanglement is considered Low Risk under the yellow-bellied Glider conservation advice. Barbed wire entanglement is scored Low, Moderate and High relative to the amount of barbed wire in and bordering the site and weighted according to risk factor relative to the expected threat score for each (summed vertically as 15, 7 or 1).
    - Habitat degradation from feral Deer is considered Low Risk under the Yellow-bellied Glider conservation advice. Deer degradation is scored Low, Moderate and High relative to the presence of Deer and weighted according to risk factor relative to the expected threat score for each (15, 7 or 1).

7. species mobility capacity – This attribute is a measure of the presence and severity of factors that would contribute to a reduction in mobility of Yellow-bellied Glider and is scored on the presence of roads or cleared areas.

In developing the MHQA, three (3) species habitat index characteristics were nominated — role of site location to overall species population in the state, threats to the species and species mobility capacity.

Species Stocking Rate (40%)

The MHQA incorporates species stocking rate as an attribute not discussed under the traditional terrestrial habitat assessment methodology. Species stocking rates are estimates of the Yellow-bellied Glider carrying capacity of the site at the time of undertaking the survey. Given the discreet nature of the Yellow-bellied Glider 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 of Yellow-bellied Glider on or adjacent to the assessment unit.
- Species usage of the site (habitat type and evidenced usage) – evidence of Yellow-bellied Glider usage of the assessment unit.
- Approximate density of the species on the site – evidence of Yellow-bellied Glider records in the assessment unit.
- Role/importance of species population on site – considers whether the site is a key source population for breeding, dispersal, is necessary for maintaining genetic diversity or near the limit of the species' range.

A38. YELLOW-BELLIED GLIDER IMPACTS

Notes:
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Layer Sources
Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community
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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/

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LEGEND

- Qld DCDB
- Referral Area [90.4 ha]
- Existing cleared track
- Direct Impact
- Indirect Impact

Engineering Detail

- Road Design
- Batters

Assessment Units Impacted

- *Assessment Unit 1:* Pre-clear RE 12.9-10.19a [5.9 ha directly impacted, 25.7 ha indirectly impacted]
- *Assessment Unit 2:* Pre-clear RE 12.9-10.2/12.9-10.7 [8.2 ha directly impacted, 25.2 ha indirectly impacted]
- *Assessment Unit 3:* Pre-clear RE 12.3.11/12.3.7 [1.5 ha directly impacted, 4.7 ha indirectly impacted]
- *Assessment Unit 4:* Pre-clear RE 12.9-10.7a [1.2 ha directly impacted, 2.9 ha indirectly impacted]

Hollow Tree Plot

- Tree with medium hollows (total medium hollows directly impacted: 44)
- Tree with large hollows (total large hollows directly impacted: 114)
- Tree with medium hollows (total medium hollows indirectly impacted: 36)
- Tree with large hollows (total large hollows indirectly impacted: 10)

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	15/10/2025	Preliminary	TF	AD

N 0 100 200 300 400 500 m

1:10,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

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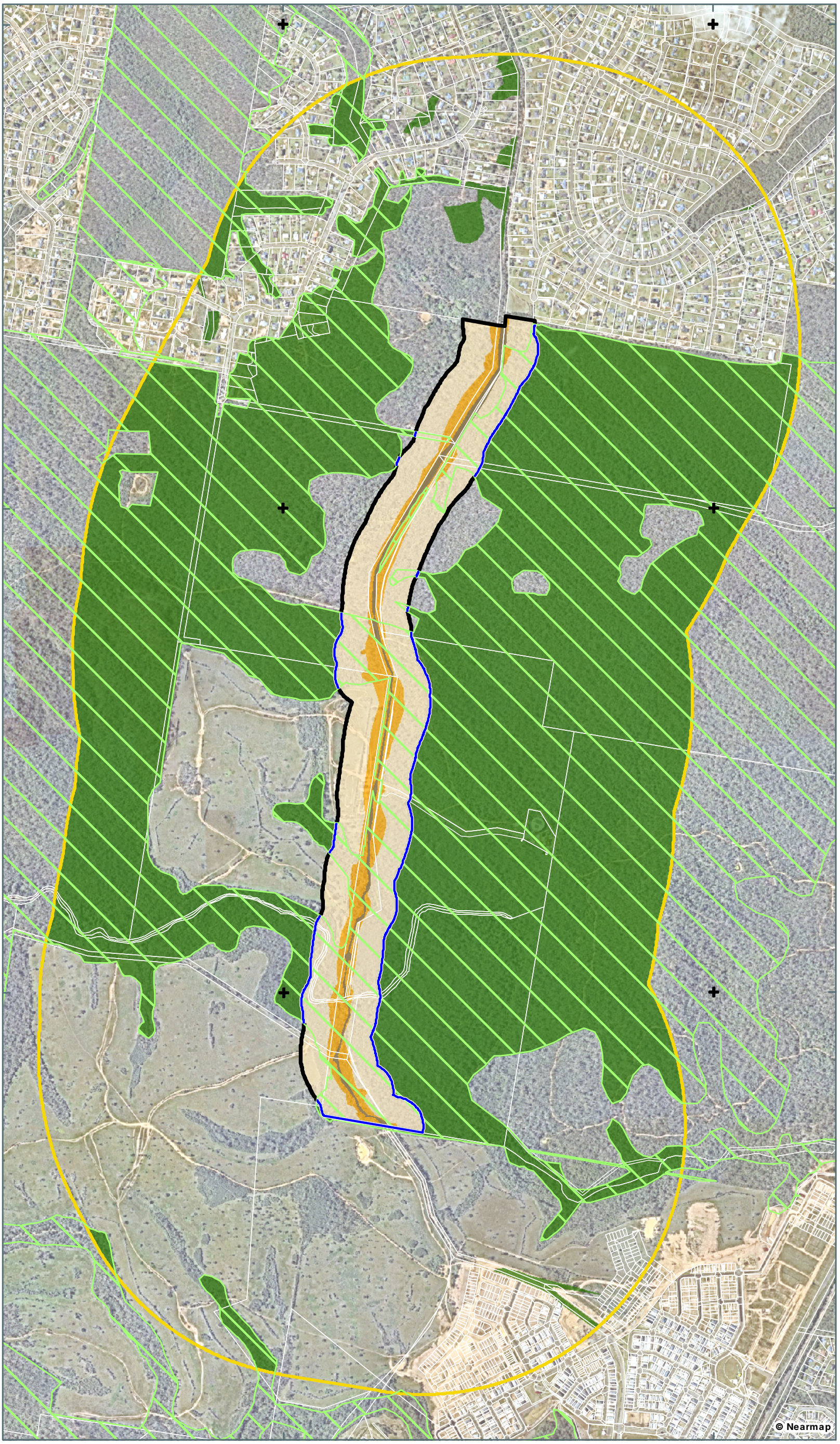
A39. YELLOW-BELLIED GLIDER CONTEXT ASSESSMENT



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

Layer Sources

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

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

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LEGEND

- Qld DCDB
- Referral Area
- Existing Impact
- Direct Impact
- Indirect Impact
- 1km buffer
- Percentage of direct impact boundary length supporting a connection off and on site to Yellow-bellied Glider habitat - 56%
- Percentage of Yellow-bellied Glider habitat within 1km of direct impact area (48%)
- Size of Yellow-bellied Glider habitat patch > 500 ha

AMENDMENTS

Issue	Date	Description	Drawn	Checked
A	17/10/2025	Preliminary	TF	AD

N

0 100 200 300 400 500 m

1:15,000 @ A3 | Transverse Mercator | GDA 2020 | Zone 56

Saunders Havill
BOWENHILLS | SPRINGFIELD
1300 123 744 | mail@saundershavill.com

PEET Flagstone City Pty Ltd

New Beith Road

Address / RPD: *New Beith, QLD*

17/10/2025

8418 E A39 NBR YBG Context A

Discussion – Quantum of Impact

The habitat quality scores for each assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A59** to **Table A67**. 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 hollow counts are used for Quality and Availability of Shelter.

Site Condition (30%)

AU1 (Non-remnant RE12.9-10.19a) achieved an average score for Site Condition of **1.93** out of 3. AU2 (Remnant RE12.9-10.2) achieved an average score for Site Condition of **2.03** out of 3. AU3 (Remnant RE12.3.11) achieved an average score for Site Condition of **1.37** out of 3. AU4 (Remnant RE12.9-10.7) achieved an average score for Site Condition of **1.99** out of 3.

The transects generally scored poorly for large trees per ha, coarse woody debris, and non-native plant cover and scored moderately for species richness of shrubs, grasses and forbs. Refer to **Appendix A10** for raw MHQA data and photos facing north, south, east and west captured at the 50 m transect mark for each transect. As per the recorded canopy cover, all assessment units scored a 10 for quality and availability of food and foraging habitat. Based on hollow counts, Assessment Units 1, 2 and 4 scored 5 and AU3 scored 1 for quality and availability of shelter habitat.

Site Context (30%)

The results of the Yellow-bellied Glider context assessment are present in **Plan A39**. The patch size was determined to be > 500 hectares. The percentage of boundary length of the impact was calculated at 56% and the percentage of habitat within 1 km of the impact site is 48%.

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 connected to the site in this instance. This attribute is scored such that is reflects the fact that larger patches are less susceptible to ecological edge effects and are more likely to sustain viable populations of native flora and fauna than smaller patches. The size of patch attribute was calculated using GIS, and achieved a score of 10 out of 10 as the site was calculated to be >500 ha (greater than 200 ha as per the *Queensland BioCondition Assessment* methodology (**Plan A39**).

Connectedness

As a landscape level attribute, connectedness aims to assess the degree to which the assessment unit is connected with adjacent Yellow-bellied Glider habitat. Connectedness relates to the capacity of the species to disperse through the landscape between sustainable patches of habitat, and therefore has important implications for species persistence. Connectedness was calculated using GIS, with the percentage of project area boundary length supporting habitat connection off and on-site was calculated at 56%, and consequently this attribute scored a 4 out of 5 (**Plan A39**).

Context

The context attribute refers to the amount of habitat that is retained within a 1 km buffer of the site being assessed and is calculated using GIS. Retained habitat within a 1 km buffer of the site was calculated at 48%, and therefore the context attribute achieved a score of 4 out of 5 (**Plan A39**).

Ecological Corridors

GIS mapping was utilised to identify the site's role in any ecological corridors on or adjacent to the site (refer **Plan A29**). The site does not form part of any mapped ecological corridors. Therefore, this attribute was scored 0 out of 6.

Role of site location to species overall population in the state

This attribute aims to quantify the geographical importance of the site for Yellow-bellied Glider populations across the broader state. This attribute achieved a score of 5 out of 5 given the site contains potential habitat for the Greater Glider.

Threats to the species

The threats to the species attribute aims to quantify the risk to survival of the Yellow-bellied Glider on-site. Key known threats to the survival of the species include the existing roads and canopy breaks, as well as predation by feral animals and uncontrolled fire regimes.

Table A58 provides a risk matrix relative to the conservation advice for the Yellow-bellied Glider to determine threats to species. Essentially, each of the threats identified within the conservation advice is weighted relative to the identified level of risk, with the weighted scores summed to provide the threat score, noting the MHQA allows for only scores of 1 (high), 7 (moderate) or 15 (low) for threats.

Table A58: Threats Matrix Assessment for the Yellow-bellied Glider

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

Metric	Low	Moderate	High
Score Weighting	**4**	**1.8**	**0.25**
Inappropriate Fire Regimes Very High Risk	Current Government endorsed Bushfire Management Plan (BMP) to protect the Yellow-bellied Glider is in effect.	Non-Yellow-bellied Glider specific BMP in effect. or; Low fuel load and low fire risk.	Site has a high fuel load and/or high fire risk.
Score Weighting	**4**	**1.8**	**0.25**
Timber Harvesting Very High Risk	No timber harvesting on site.	Historical timber harvesting having occurred on site	Current timber harvesting occurring on site
Score Weighting	**4**	**1.8**	**0.25**
Feral Cat Attack Low Risk	No feral cats recorded on site.	Feral cats recorded on site and adequate refuge for Yellow-bellied Glider (>70% canopy cover).	Feral cats recorded on site and limited refuge for Yellow-bellied Glider (<70% canopy cover)
Score Weighting	**0.75**	**0.4**	**0.06**
Fox Attack Low Risk	No foxes recorded on site.	Foxes recorded on site and adequate refuge for Yellow-bellied Glider (>70% canopy cover).	Foxes recorded on site and limited refuge for Yellow-bellied Glider (<70% canopy cover)
Score Weighting	**0.75**	**0.4**	**0.06**
Barbed Wire Entanglement Low Risk	No barbed wire on or adjoining the site	Up to 50% of the site and boundary is traversed by barbed wire	More than 50% of the site and boundary is traversed by barbed wire
Score Weighting	**0.75**	**0.4**	**0.06**
Deer Degradation Low Risk	No deer recorded on site.	Deer recorded on site and adequate refuge for Yellow-bellied Glider (>70% canopy cover).	Deer recorded on site and limited refuge for Yellow-bellied Glider (<70% canopy cover)
Score Weighting	**0.75**	**0.4**	**0.06**
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)

The site is considered to have a hire fuel load being unmanaged remnant and regrowth vegetation and multiple burnt out cars are present, including one dumped and set alight while field work was being undertaken. The site scores high for inappropriate fire regimes.

The site is zoned for development. No timber harvesting occurs on site. Foxes, Cats and Deer were not recorded on site. The entire road is flanked by barbed wire fencing to contain stock.

Analysis against the risk matrix suggests that the site scores 6.81, or a 7 out of a possible 15 for threats (**Table A58**).

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 in order to meet its needs for survival. 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 highways or residential developments. Conversely, the Yellow-bellied is considered a relatively immobile species due to its slow-moving nature and vulnerability to threats on ground as outlined above. Notably, species mobility is compromised where canopy gaps occur as presented by the existing road reserve and cleared tracks and fire trails In this instance, the species mobility capacity for the Yellow-bellied Glider on-site was assigned the conservative moderate score of 7 out of 10.

Species Stocking Rate (40%)

The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Yellow-bellied Glider carrying capacity of each assessment unit at the time of undertaking the survey. A species stocking rate score of 25 out of 70 was attributed to all assessment units. This was attributed to the fact that evidence of Yellow-bellied Glider has records in the vicinity and potential denning and foraging habitat is available on site.

Summary

To summarise, the action is considered to impact on potential habitat for the Yellow-bellied Glider, having a total impact of **5.34 out of 10** (refer **Table A59**).

For the features-based assessment, as per **Plan A38**, the site maintains a total of 205 hollows that will be directly or indirectly impacted. Applying a 20% margin to account for survey error, an estimate of 245 hollows will be impacted.

Table A59: MHQA Assessment – AU1

Assessment Unit - Regional Ecosystem - YBG	AU 1 - Cat X - cleared with scattered regrowth (Preclear RE12.9-10.19a)					
	RE12.9-10.19a Benchmark	Transect 2	Transect 3	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	100	**100**	100	**5**
Native plant species richness - trees	**4**	10	11	**10.5**	262.50	**5**
Native plant species richness - shrubs	**6**	1	3	**2**	33.33	**2.5**
Native plant species richness - grasses	**7**	6	5	**5.5**	78.57	**2.5**
Native plant species richness - forbs	**14**	7	12	**9.5**	67.86	**2.5**
Tree canopy height (Canopy)*	**24**	22	21	**21.5**	89.58	5
Tree canopy height (Sub-canopy)*	**10**	15	16	**15.5**	155.00	5
					***Average tree canopy height**	**5**
Tree canopy cover (Canopy)**	**59**	95.4	53.1	**74.25**	125.85	5
Tree canopy cover (Sub-canopy)**	**22**	58.1	71.2	**64.65**	293.86	3
					****Average tree canopy cover**	**4**
Shrub canopy cover	**11**	16.9	0.7	**8.8**	80.00	**5**
Native grass cover*	**16**	15	27	**21**	131.25	**5**
Organic litter*	**53**	67	48	**57.5**	108.49	**5**
Large trees (euc plus non-euc) (per ha)	**24**	0	0	**0**	0.00	**0**
Coarse woody debris (per ha)	**285**	136	70	**103**	36.14	**2**
Non-native plant cover	**0**	20	20	**20**	20.00	**5**
Quality and availability of food and foraging habitat	**NA**	10	10	**10**	-	**10**
Quality and availability of shelter	**NA**	5	5	**5**	-	**5**
					Site Condition Score (/100)	**64.25**
					Overall Site Condition Score - out of 3	**1.93**
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
YBG Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	25	25	25		**25**
					Species Stocking Rate Score (/70)	**25.00**
					Overall Species Stocking Rate Score - out of 4	**1.43**
Overall Assessment Unit Score						**5.34**

Table A60: Species Stocking Rate Results – AU1

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**25/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A61: MHQA Assessment - AU2

Assessment Unit - Regional Ecosystem - YBG	AU 2 - Cat B - highly disturbed mapped remnant veg with scattered mature Eucalypt species (RE12.9-10.2)					
	RE12.9-10.2 Benchmark	Transect 1	Transect 8	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	50	**75**	75	**3**
Native plant species richness - trees	**6**	5	7	**6**	100.00	**5**
Native plant species richness - shrubs	**7**	5	5	**5**	71.43	**2.5**
Native plant species richness - grasses	**7**	6	5	**5.5**	78.57	**2.5**
Native plant species richness - forbs	**13**	9	13	**11**	84.62	**2.5**
Tree canopy height (Canopy)*	**21**	21	17	**19**	90.48	5
Tree canopy height (Sub-canopy)*	**12**	12	12	**12**	100.00	5
					***Average tree canopy height**	**5**
Tree canopy cover (Canopy)**	**64**	77.3	44.6	**60.95**	95.23	5
Tree canopy cover (Sub-canopy)**	**20**	50.9	67.3	**59.1**	295.50	3
					****Average tree canopy cover**	**4**
Shrub canopy cover	**6**	1.1	18.6	**9.85**	164.17	**5**
Native grass cover*	**21**	6	2	**4**	19.05	**1**
Organic litter*	**48**	51	55	**53**	110.42	**5**
Large trees (euc plus non-euc) (per ha)	**38**	38	4	**21**	55.26	**10**
Coarse woody debris (per ha)	**506**	446	92	**269**	53.16	**5**
Non-native plant cover	**0**	35	10	**22.5**	22.50	**5**
Quality and availability of food and foraging habitat	**NA**	10	10	**10**	-	**10**
Quality and availability of shelter	**NA**	5	5	**5**	-	**5**
					Site Condition Score (/100)	**67.75**
					Overall Site Condition Score - out of 3	**2.03**
SITE CONTEXT						

Size of patch	**10**	10	10	10		**10**
Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
YBG Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	25	25	25		**25**
					Species Stocking Rate Score (/70)	**25.00**
					Overall Species Stocking Rate Score - out of 4	**1.43**
Overall Assessment Unit Score						**5.44**

Table A62: Species Stocking Rate Assessment– AU2

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**25/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A63: MHQA Assessment – AU3

Assessment Unit - Regional Ecosystem - YBG	AU 3 - Cat B - Remnant vegetation associated with Flagstone Creek (RE12.3.11/12.3.7)					
	RE12.3.11 Benchmark	Transect 4	Transect 7	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	0	**50**	50	**3**
Native plant species richness - trees	**7**	4	8	**6**	85.71	**2.5**
Native plant species richness - shrubs	**7**	3	4	**3.5**	50.00	**2.5**
Native plant species richness - grasses	**12**	2	2	**2**	16.67	**0**
Native plant species richness - forbs	**25**	6	11	**8.5**	34.00	**2.5**
Tree canopy height (Canopy)*	**23**	23	19	**21**	91.30	5
Tree canopy height (Sub-canopy)*	**8**	8	14	**11**	137.50	5
					***Average tree canopy height**	**5**
Tree canopy cover (Canopy)**	**56**	63.7	28.2	**45.95**	82.05	5
Tree canopy cover (Sub-canopy)**	**33**	52.3	79.5	**65.9**	199.70	5
					****Average tree canopy cover**	**5**
Shrub canopy cover	**20**	21.4	16.5	**18.95**	94.75	**5**
Native grass cover*	**44**	8	67	**37.5**	85.23	**3**
Organic litter*	**37**	57	6	**31.5**	85.14	**5**
Large trees (euc plus non-euc) (per ha)	**30**	14	8	**11**	36.67	**5**
Coarse woody debris (per ha)	**555**	289	178	**233.5**	42.07	**2**
Non-native plant cover	**0**	30	25	**27.5**	27.50	**3**
Quality and availability of food and foraging habitat	**NA**	10	10	**10**	-	**10**
Quality and availability of shelter	**NA**	1	1	**1**	-	**1**
					Site Condition Score (/100)	**45.75**
					Overall Site Condition Score - out of 3	**1.37**
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
YBG Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	25	25	25		**25**
					Species Stocking Rate Score (/70)	**25.00**
					Overall Species Stocking Rate Score - out of 4	**1.43**
Overall Assessment Unit Score						**4.78**

Table A64: Species Stocking Rate Results – AU3

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**25/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A65: MHQA Assessment – AU4

Assessment Unit - Regional Ecosystem - YBG	AU 4 - Cat B - Eucalypt dominated remnant veg. (RE12.9-10.7)					
	RE12.9-10.7 Benchmark	Transect 5	Transect 6	Average of Transect(s)	% Benchmark	Score
SITE CONDITION						
Recruitment of woody perennial species in EDL	**100**	100	100	**100**	100	**5**
Native plant species richness - trees	**3**	4	8	**6**	200.00	**5**
Native plant species richness - shrubs	**5**	3	6	**4.5**	90.00	**2.5**
Native plant species richness - grasses	**8**	3	4	**3.5**	43.75	**2.5**
Native plant species richness - forbs	**26**	6	10	**8**	30.77	**2.5**
Tree canopy height (Canopy)*	**21**	16	17	**16.5**	78.57	5
Tree canopy height (Sub-canopy)*	**10**	8	5	**6.5**	65.00	3
					***Average tree canopy height**	**4**
Tree canopy cover (Canopy)**	**40**	18.6	51.9	**35.25**	88.13	5
Tree canopy cover (Sub-canopy)**	**8**	78.9	89.8	**84.35**	1054.38	3
					****Average tree canopy cover**	**4**
Shrub canopy cover	**3**	12.2	1.3	**6.75**	225.00	**3**
Native grass cover*	**61**	2	35	**18.5**	30.33	**1**
Organic litter*	**20**	91	36	**63.5**	317.50	**3**
Large trees (euc plus non-euc) (per ha)	**18**	18	10	**14**	77.78	**10**
Coarse woody debris (per ha)	**272**	604	232	**418**	153.68	**5**
Non-native plant cover	**0**	5	10	**7.5**	7.50	**5**
Quality and availability of food and foraging habitat	**NA**	10	10	**10**	-	**10**
Quality and availability of shelter	**NA**	5	5	**5**	-	**5**
					Site Condition Score (/100)	**66.25**
					Overall Site Condition Score - out of 3	**1.99**
SITE CONTEXT						
Size of patch	**10**	10	10	10		**10**

Connectedness	**5**	4	4	4		**4**
Context	**5**	4	4	4		**4**
Ecological Corridors	**6**	0	0	0		**0**
Role of site location to species overall population in the state	**5**	5	5	5		**5**
Threats to the species	**15**	7	7	7		**7**
Species mobility capacity	**10**	7	7	7		**7**
					Site Context Score (/56)	**37**
					Overall Site Context Score - out of 3	**1.98**
SPECIES STOCKING RATE						
YBG Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**70**	25	25	25		**25**
					Species Stocking Rate Score (/70)	**25.00**
					Overall Species Stocking Rate Score - out of 4	**1.43**
Overall Assessment Unit Score						**5.40**

Table A66: Species Stocking Rate Results – AU4

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	5/10
Species usage of the site (habitat type and evidenced usage)	15/15
Approximate density (per ha)	0/30
Role / importance of species population on site*	5/15
Total Species Stocking Rate Score	**25/70**
***SSR Supplementary Table – Total supplementary score 0 = 0, 5-15 = 5, 20-35 = 10, 40-45 = 15**	
Key source population for breeding	0/10
Key source population for dispersal	5/5
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table A67: Yellow-bellied Glider MHQA Scoring Summary

MHQA Final Weighting - YBG	AU 1	AU 2	AU 3	AU 4
Site Condition (/3)	1.93	2.03	1.37	1.99
Site Context (/3)	1.98	1.98	1.98	1.98
Species Stocking Rate (/4)	1.43	1.43	1.43	1.43
Assessment Unit Area (Impact) (ha)	31.60	33.40	6.20	4.10
Total Impact Area (ha)	75.30	75.30	75.30	75.30
Size Weighting	0.42	0.444	0.08	0.05
AU Weighted Score	2.24	2.41	0.39	0.29
Total Weighted Score	**5.34**			

4.5.7. Spotted-tailed Quoll (Dasyurus maculatus maculatus)

Significant Impact Assessment

Assessment against the Significant Impact Guidelines 1.1 for the Spotted-tailed Quoll

EPBC Act, Spotted-Tail Quoll populations are listed as Endangered, effective from 1 September 2020. The species is listed under Queensland Nature Conservation Act 1992 (Qld) (NCA) as Endangered. As such, the Federal Significant Impact Guidelines can be utilised to determine if a significant impact on Spotted-tailed Quoll may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches.

To determine whether the proposed action is likely to have a significant impact on the Spotted-tailed Quoll, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided below.

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 a population

Assessment: The New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing mature Eucalypt sp., Acacia sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

No evidence of Spotted-tailed Quoll was observed during targeted field surveys onsite. No records of the species exist within 5 km of the impact site and buffer area according to Atlas of Living Australia (ALA) (**Plan A21**). Substantially higher quality vegetation occurs in the west would likely be preferentially utilised for foraging. Vegetation to the east of the road reserve has been earmarked for development within the Greater Flagstone PDA. Once vegetation on surrounding impact areas have been further cleared, there will be limited connectivity to the referral area and adjoining vegetation to the west, aside from retained waterway areas throughout the road reserve (**Plan A3**). The proposed action is unlikely to reduce the size of the population because the site is not currently being utilised by the species and more favourable connected habitat occurs in the broader landscape. It is considered highly unlikely that the removal of vegetation within the referral area would affect the viability or size of any Spotted tail Quoll populations in the area.

2. Reduce the area of occupancy of an important population

Assessment: Field surveys confirmed relatively few desirable habitat features for Spotted-tail quoll occurs onsite. The habitat can be described as open woodland with the presence of

scattered coarse woody debris which could be used for shelter. In comparison to the connected higher value habitat in the broader landscape, habitat within the impact area is not preferable.

No observations of this species have been recorded within 5 km of the site. In the last 20 years (**Plan A21**). When the search radius is extended to 10km records are observed north-east of site, however the most recent occurrence was in 2011. In addition, camera trapping on adjacent properties and within the broader Logan region did not find any evidence of the species.

The proposed road alignment is already disturbed by past clearing, both within the alignment and in adjoining cleared development areas, and utilisation by vehicles creating noise, light and dust. Due to the high disturbance with vehicle use and other illegal uses, the area is considered poor quality habitat for the species.

In addition, surrounding impact from earmarked development is likely to restrict the connectivity of habitat for Spotted-tailed Quolls with the impact area largely isolated from other habitat (**Plan A3**). Due to the above considerations combined it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Spotted-tailed Quolls.

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

Assessment: The site is currently subject to significant fragmentation to the north with existing residential development (**Figure 2**). Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA, which will further fragment Spotted-tailed Quoll habitat (**Plan A3**).

Field surveys confirmed the presence of sparse fallen logs and burrows for shelter, within the road reserve and scattered within adjacent remnant bushland. However, no individuals were recorded during field surveys. Furthermore, camera trapping on adjacent properties and within the broader Logan region did not find any evidence of the species. Online databases show no Spotted-tailed Quoll presence within 5 km of the site (**Plan A21**). In the broader landscape the most recent records occur in 2011 occurring north east of the impact site.

Due to the high disturbance with vehicles, other illegal uses, and the modification of surrounding habitat, the onsite habitat values are considered fragmented. Any current connectivity via vegetation areas in the south of site will be maintained with the development through the use of Fauna movement solutions across the impact area (refer **Plan A32**).

Considering the existing fragmentation present in the landscape and lack of existing populations within the context of the site it is considered unlikely that the action will fragment an existing population and thus no significant impact is considered.

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

Assessment: The Significant Impact Guidelines provide the following definition for 'habitat critical to the survival of a species'. *"Habitat critical to the survival of a species or ecological community*' refers to areas that are necessary:

1. *For activities such as foraging, breeding, roosting or dispersal*
2. *For the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)*
3. *To maintain genetic diversity and long-term evolutionary development*
4. *For the reintroduction of populations or recovery of the species or ecological community.*

Responses to the definition of habitat critical to the survival of a species' follows below:

1. The referral site shows no evidence of current Spotted-tail Quoll usage and will not be accessible for Spotted-tailed Quoll to use for foraging, breeding, roosting or dispersing as a result of the development within the Greater Flagstone Development Area existing fragmenting factors on all sides.
2. Substantial clearing has occurred within the northern and central extents of the road reserve. In this area, vehicle disturbance is common among other illegal uses. Throughout the road reserve, large mature hollow-bearing trees remain which provide potential habitat for the Spotted-Tailed Quoll. However, due to fragmentation to the adjacent bushland, high disturbance levels and a lack of local records, it is considered a low likelihood that this habitat is being utilised by Spotted Tailed Quoll and thus unlikely to be essential to the species survival.
3. Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Spotted-tailed Quoll within the referral area, suggesting the vegetation on-site is not utilised by Spotted-tailed Quoll. The referral area is therefore unlikely to contribute to genetic diversity of the species.
4. The referral area will be isolated from other Spotted-tailed Quoll habitat onsite following the development of surrounding residential areas. The referral area forms part of the Flagstone City development area which will consist of future residential areas. In addition, significant current threats exist within and surrounding the referral area including wild dogs, vehicle use, weed encroachment, illegal offroad vehicle use and the train line further east. The referral site is not considered suitable for the reintroduction of Spotted-tailed Quoll nor will it be able to aid in the recovery of the species.

5. Disrupt the breeding cycle of an important population

Assessment: The limited records of the species within the broader landscape over the last 20 years in combination with no evidence of Spotted-tail Quoll activity onsite during field surveys or on motion capture photos suggests that the impact site does not presently support a breeding population.

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 New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The vegetation across the site comprises cleared road reserve, scattered hollow-bearing

mature Eucalypt sp., Acacia sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

Field surveys confirmed relatively few desirable habitat features for Spotted-tail quoll occurs onsite. The habitat can be described as open woodland with the presence of scattered coarse woody debris which could be used for shelter. However compared to the broader landscape, habitat onside is not preferable.

No observations of this species have been recorded within 5 km of the site. When the search radius is extended to 10km records are observed north-east of site, however the most recent occurrence was in 2011 (**Plan A21**). Furthermore, no evidence of Spotted-tailed Quoll was observed during targeted field surveys onsite. Due to the high disturbance with vehicle use and other illegal uses, it is considered poor quality habitat for the species.

Substantially higher quality available habitat to the west of the road reserve, located in White Rock – Spring Mountain Conservation Park and Stewartdale and Undullah Nature Refuge.

Given the limited habitat values located onsite, the clearing required as part of the proposed action is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the Spotted-tailed Quoll is likely to decline.

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

Assessment: Invasive species such the feral cat (*Felis catus*) and Dogs (*Canis lupus familiaris*) are identified as threats to the species. 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: At present, no diseases are known to significantly impact on the species in the wild, with any concern relating to disease within the captive bred populations.

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 'National Recovery Plan for the Spotted-Tailed Quoll was adopted under the EPBC Act in 2016, however has since expired as of 2021. The key management priorities for species recovery include habitat loss disturbances and modifications, invasive species and fire. As there is no evidence of occupancy of Spotted-tailed Quoll within the context of the impact site and limited desirable habitat values located within the impact area it is considered that the action is unlikely to interfere substantially with the recovery of the species and thus a significant impact is not considered.

4.5.8. White-Throated Needletail (Hirundapus caudacutus)

There is no adopted Recovery Plan as the Conservation advice provides sufficient direction. In Australia population survival depends on the retention of habitat the provides aerial insects such as intact grassland, woodland and forest vegetation. The conservation advice prioritises the identification and protection of important habitat to the White-throated Needletail and invertebrate prey as well as minimising threats.

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 a population

Assessment: The New Beith road upgrade comprises a direct impact of 18.9 ha and 3.2 km in length, 4.4 ha existing cleared road and track with a buffer of 67.1 ha, totalling the referral area to 90.4 ha. The site contains assorted values including cleared road reserve, scattered hollow-bearing mature Eucalypt sp., Acacia sp. dominated understorey regrowth, *Allocasuarina littoralis* understorey vegetation, and *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Lophostemon suaveolens* (Swamp Box) dominated waterway areas. The site has been subjected to disturbance from historic clearing through the centre of the road reserve in addition to ongoing disturbance from illegal vehicle use, rubbish dumping and logging.

More suitable preferable habitat with a higher density of suitable roosting and foraging habitat exists to the west of site located within White Rock - Spring Mountain Forest Park and Stewartdale Nature Reserve, which would provide more suitable habitat. Breeding habitat in the form of hills and mountains are absent, with the nearby National Park is predicted to provide an environment of significantly higher value to that on-site.

Assorted records of the species occur within 5 and 10 km of the site in the last 20 years exist with patches to the north and the south east containing the most concentrated collection of records (**Plan A22**). Vegetation adjacent to the road reserve has been earmarked for development within the Greater Flagstone PDA. Once vegetation on surrounding impact areas have been further cleared, there will be limited connectivity to the referral area and adjoining vegetation to the west, aside from retained waterway areas (**Plan A3**). The proposed action is unlikely to reduce the size of the population because the site will be fragmented as a result of surrounding development and is not considered to display evidence of White-throated Needletail usage or support an important population of the species. It is considered highly unlikely that the removal of vegetation within the referral area would lead to a long-term decrease in the size of any local White-throated Needletail populations, 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 impact area associated with the proposed development comprises a relatively narrow linear strip of vegetation given the availability of intact vegetation to the north and west of site. No evidence of White-throated Needletail was noted within the impact site, with

scattered records existing within the broader context of the site over the last 20 years and only one (1) recorded via Wildnet. The predominately aerial nature of the species and location of more desirable habitat in the broader landscape suggests that the results of the action are unlikely to reduce the occupancy of the species. A significant impact as a result of the proposed action is not likely.

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

Assessment: The site is currently subject to fragmentation to the north with existing residential development (**Figure 2**). Land directly to the east and west of the road reserve is earmarked for development within the Greater Flagstone PDA (**Plan A3**), which will further fragment habitat values within the existing road reserve. In the wider landscape, significant fragmentation currently exists to the east, with residential development and major railway infrastructure in these areas.

Assorted records of the species occur within 5 and 10km of the site in the last 20years exist with patches to the north and the south east containing the most concentrated collection of records (**Plan A22**). The proposed action involves the clearing of a linear strip of vegetation, relatively narrow given the preferable habitat values in the broader landscape. Given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.

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

Assessment: The White-throated Needletail is considered almost exclusively aerial and is known to be recorded over most habitat sites. The vegetation proposed to be removed includes a combination of existing cleared road parcel, non-remnant, regrowth and remnant vegetation. While habitat in the form of hollow bearing trees are present within the impact site, White-throated Needletail are considered to preferentially select hollows in more expansive mature forests. As the proposed development area exists within a relatively narrow linear strip, and considering the more favourable habitat present within the broader landscape, the habitat within the impact site is unlikely to be considered critical, under the conservation advice for White-throated Needletails.

5. Disrupt the breeding cycle of an important population

Assessment: White-throated Needletails are a migratory species and breeds in forest in south-eastern Siberia, Mongolia, the Korean Peninsula and northern Japan. Therefore, as White-throated Needletails do not breed in Australia, the development will not impact the breeding cycle.

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 White-throated Needletail is an almost exclusively aerial. As the species is recorded over most habitat types, it is unlikely that the species relies on the assorted habitat values present on site which includes, remnant, regrowth and existing cleared areas.

The removal of vegetation located on-site is unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of foraging habitat in the surrounding area.

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.

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: There are no recovery plans or actions listed for the recovery of the White-throated Needletail. The conservation advice on the SPRAT profile listed for the White-throated Needletail states that a recovery plan is not required as the approved conservation advice provides sufficient direction.

Threats to the species listed in the approved conservation advice includes collision with wind turbines, overhead wires, windows and lighthouses. Insecticides is considered another reason causing the decline in the species. The loss of roosting sites in Australia including forest and woodland habitats is also considered a threat to the species and resulted in a loss of invertebrate prey.

The removal of the narrow strip of potential habitat on the subject site which contains some habitat in the form of hollow bearing trees is not considered to interfere with the recovery of the species. White-throated Needletails are considered an aerial insectivore that is known to fly over a variety of habitats. Furthermore, more favourable habitat occurs to the west of site with a greater abundance of hollow bearing trees and foraging habitat. Therefore, the removal of this vegetation is unlikely to significantly impact the species.

4.6. Direct, Indirect and Cumulative Impacts

4.6.1. Direct Impacts

Vegetation Clearing

The proposed action will be entirely located within the site boundary and will require the removal of all vegetation within the identified direct impact area (**Plan A27**) for the New Bieth Road upgrade. Final earthworks and vegetation clearing requirements associated with these proposed uses will be determined as part of the detailed engineering design phase, but will not impact any additional areas outside the impact area buffer.

Habitat Removal

The proposed action will impact Category B, Category C and Category X vegetation, which currently provides variable habitat values for native flora and fauna species. The proposed impact area has been located within the existing road parcel, to limit additional clearing and disturbance of native flora and fauna species.

However, as identified by the submitted Referral Material (refer to **Part B**) and the Department's PD Request, the vegetation clearing required to facilitate the proposed action will result in the loss of habitat critical to the survival of the Koala (*Phascolarctos cinereus*) and the removal of 1.5 ha of Potential TEC Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland Bioregion, which are both considered MNES. The specific quantum and quality of the proposed impact to habitat for the potential SEFFW TEC and the Koala (*Phascolarctos cinereus*) are assessed in detail in **Sections 4.3 and 4.4** of the Preliminary Documentation respectively.

Direct Mortality or Injury

Direct mortality or injuries to fauna is considered highly unlikely to occur throughout the construction phase of the proposed action given the relatively limited species abundance and diversity observed during field surveys.

This risk of fauna mortality or injury has been further mitigated through the fauna safe movement corridors proposed along the road upgrade (**Plan A32**). Additionally, all clearing will be undertaken in accordance with mitigation measures outlined in **Section 5.2**.

Fragmentation

The proposed action impact area is located in the portion of the site that contains an existing cleared road and adjacent disturbed and modified habitat values.

Potential habitat values are located within the proposed impact and buffer area however, as previously discussed in **Section 4**, areas of vegetation are presently fragmented from vegetation towards the northern extent and more contiguous higher value vegetation occurs in the west. Furthermore, areas to the east of site are currently under EPBC determination and earmarked for future development as part of the Greater Flagstone PDA, therefore greater fragmentation of the site is likely to limited in the future (**Plan A3**).

4.6.2. Indirect Impacts

In response to Item 4.2 f) of the PD Request the ***"indirect or facilitated impacts that may result from the proposed action during the pre-construction, construction and operation phases, 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, resulting in disturbance and fauna strike.***
- ***iii. Increased presence of dogs.***
- ***iv. Earthworks – potential to generate dust emissions from the removal of vegetation and movement of soil.***

v. Disturbance from increased noise, artificial light, sediment generation and other relevant stressors."

The impacts based on Clearing and Construction and Post Construction are outlined below. It is noted that no pre-construction activities were predicted to have direct or indirect impacts on species.

Clearing and Construction

Weeds

Increased vehicle movement during the construction phase has the potential to increase the spread of weeds in the area, particularly during the vegetation clearing phase, however, the site is already highly disturbed by weed invasion, most notably exotic grasses and *Lantana camara* (Lantana). With implementation of standard mitigation measures, the project is likely to result in a negligible impact to ecological values due to the potential introduction/spread of weeds.

Vehicle Movement

During construction, a number of vehicles will be required on the referral area. Direct impacts from vehicle movements on threatened species and vegetation communities include:

- damage or destruction of vegetation or fauna habitat by vehicles traversing these areas; and
- fauna strike.

Indirect impacts include:

- interference of fauna through visual and noise impacts. This in turn can affect feeding, roosting, breeding or nesting behaviour;
- introducing and/or spreading weeds or feral animals carried on or in vehicles, resulting in deterioration or loss of vegetation and important fauna habitat; and
- damage or destruction of vegetation and fauna habitat through smothering by dust generated by vehicles traversing the project area.

With implementation of standard mitigation measures, such as exclusion fencing and dedicated fauna passage (**Plan A32** and **Section 5.2.8**), the project is likely to result in a temporary and minor impact to ecological values due to vehicular movements. Ecological field survey confirmed only common and highly mobile fauna are present on the site.

Earthworks

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 their 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. Notably the referral area exists within a relatively urbanised environment with surrounding areas utilised for commercial purposes and residential development. With the implementation of standard mitigation measures, the project is likely to result in a temporary and minor impact to ecological values in surrounding areas due to the generation of dust.

Light Emissions During Construction

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.

Presence and intensity of artificial light in the project area will temporarily increase during the construction phase; however, night works will not be common. Lighting will be directed to construction areas within the project site. Some light spillage will be inevitable and is likely to be contained. Potential impacts associated with light emissions will be temporary and are unlikely to be significant.

Noise and Vibration

Noise levels greater than existing ambient noise levels are expected during the construction within the project area. Sources of noise are likely to consist of short, intense pulses from mobile plant equipment, and more prolonged noise, with consistent vibration, pitch and volume from generators, excavators and pumps, in addition from 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 using the surrounding vegetation though, with consideration of the extent of habitat available in and adjoining the referral area and species mobility, this is likely to be a temporary and negligible to minor impact.

Increased Human Presence

Increased human activity during construction has the potential to disturb fauna within adjacent habitat areas. Resulting impacts to fauna include heightened vigilance and predator avoidance, which can disrupt foraging and roosting efficiency or deter wildlife from using particular areas. Impacts essentially represent a reduction in habitat availability due to edge effects. The project is likely to result in a temporary and minor impact to ecological values due to increased human presence on site during the construction and operational period. Much of the habitat surrounding the site will be cleared for residential development. Therefore, any impact that the proposed action has will be minor.

Post-construction

Traffic

Upon completion of the proposed action, vehicle traffic will increase compared to baseline conditions, increasing the likelihood of vehicle strike in the area. However, the probability of fauna strike is reduced due to the fact that the site is significantly fragmented from surrounding cleared areas and residential development and most fauna will generally avoid urban areas. Given the existing road reserve currently existing through the development area and current residential development located in the north, the risk of vehicle strike within the project site will not be greatly increased. Furthermore with the future development located to the east and south the risk will further be decreased.

The fauna movement solutions located in the southern portion of the impact area will allow for safe faunal movement through the impact site to maintain connectivity (**Plan A32** and **Section 5.2.8**). These will be implemented in accordance with relevant guidelines to ensure connections between existing habitat locations either side of the impact are maintained.

Artificial Light

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.

Light pollution during operation will be mitigated through design and compliance with general standards in guidelines, particularly for light required within the road reserve for safety. Lighting in this area will be directed towards the road and away from the vegetation. Some light spillage will be inevitable and is likely to be contained.

Noise

Noise levels greater than existing ambient noise levels are expected the ongoing operational phase within the impact area. Noise sources during operation are likely to comprise of vehicles and other road users.

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 using the surrounding vegetation. Noise levels are likely to increase from current levels once the road upgrade is complete as there will be increased vehicular traffic. However, the impact of this to fauna in the surrounding area is considered to be minor.

Waste Disposal

Inappropriate disposal of non-hazardous wastes can attract vermin and other wildlife to site. This may exacerbate potential impacts (e.g. road mortality). Litter may also enter surrounding environments. With implementation of standard mitigation measures, the project is likely to result in a negligible impact to ecological values due to the generation and handling of waste.

Hazardous and Dangerous Goods

Spills and leaks from transfers (e.g. fuel and/or chemicals) and inadequate storage of dangerous goods and hazardous wastes could result in point-source contamination of surrounding land. Direct adverse impacts could include toxic impacts on vegetation (resulting in degradation or loss of vegetation and habitats), direct toxic impacts on fauna (from contact, inhalation or ingestion) or indirect impacts on threatened and migratory species from habitat loss. Direct adverse impacts on surface and groundwater quality are also possible.

With the application of standard mitigation and management measures, impacts from liquid and solid waste disposal will be avoided or localised and small in scale. Further to this, the likelihood of significant spillages is considered extremely low. Therefore, the project is likely to result in a negligible impact to ecological values due to potential spills and leaks.

Potential indirect impacts on the Subtropical Eucalypt Floodplain Forest and Woodland of the New South Wales North Coast and South East Queensland Bioregions TEC and fauna associated with the Proposed Action are outlined in **Table A68**.

Table A68: Indirect impacts on Subtropical Eucalypt TEC and Koala.

Indirect Impact	Subtropical Eucalypt TEC	Fauna
a. Disturbance from increased noise, artificial light, dust, sediment generation and other relevant stressors during construction and operation of the road upgrade.	Noise **Not Applicable** Artificial Light **Not Applicable** Dust and Sediment Generation 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 for fauna. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality. With implementation of standard mitigation measures, the project is likely to result in a temporary and minor impact to any potential TEC areas due to the generation of dust.	Noise Noise levels greater than existing ambient noise levels are expected during construction within the project 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 using the surrounding vegetation. However, with consideration of the extent of habitat available in the study area, this is likely to be a temporary and negligible to minor impact. Additionally, noise levels are likely to increase once the road upgrade is complete as there will be increased vehicular traffic. Road noise will be the primary source of noise impact. Artificial Light 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

Indirect Impact	Subtropical Eucalypt TEC	Fauna
		flowering in plants). An artificial increase in lighting can also affect abundance of predators. Presence and intensity of artificial light in the project area will temporarily increase during the construction phase; however, night works will not be common. Lighting will be directed to construction areas within the project 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 implementation of standard mitigation measures, the project is likely to result in a negligible impact to any fauna in the surrounding area due to the use of light pollution during construction. <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 vehicle movement during the construction phase; • dust lift-off from exposed surfaces (e.g. construction roads); • 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

Indirect Impact	Subtropical Eucalypt TEC	Fauna
		potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality for fauna. With implementation of standard mitigation measures, the project is likely to result in a temporary and minor impact to any fauna utilising the local area due to the generation of dust.
b. Increased vehicle strike from increased frequency of vehicle movements throughout construction and operation of the road upgrade.	**Not Applicable**	Upon completion of the road upgrade, vehicle traffic will increase compared to baseline conditions, increasing the likelihood of vehicle strike of fauna utilising the area. The probability of fauna strike is reduced due to the fact that most fauna will generally avoid urban areas and the surrounding vegetation are earmarked for future development under a number of EPBC referrals. Notwithstanding, to reduce the risk of vehicular strike in the occasion that fauna do happen to enter the area, fauna friendly design measures will be incorporated throughout the road extent such as fauna crossing infrastructure and culverts to encourage safe fauna movement (**Plan A32** and **Section 5.2.8**).
c. Introduction to and /or proliferation of weeds and pathogens, in habitat for threatened species.	The proposed road upgrade is unlikely to result in an increase in weeds over the site. The creek corridors will be subject to rehabilitation and other improvement works to create a buffer between the road and Flagstone Creek Corridors. Proposed rehabilitation and regeneration activities within the creeks is anticipated to improve the ecological value of this area and improve the quality of the TEC adjacent to this area. Further, the proposed development is not considered likely to introduce pathogens that would negatively impact any fauna utilising this area.	The proposed road upgrade is unlikely to result in an increase in weeds over the site. The creek corridors will be subject to rehabilitation and other improvement works to create a buffer between the road and Flagstone Creek Corridors. Proposed rehabilitation and regeneration activities within the creeks is anticipated to improve the ecological value of this area and improve the quality of the habitat for fauna utilising this area. Further, the proposed development is not considered likely to introduce pathogens that would negatively impact any fauna the area utilising this area given the

Indirect Impact	Subtropical Eucalypt TEC	Fauna
		prevalence of disease and disturbance already within the area.
d. The increased risk of entanglement in wire fencing or other infrastructure within, and adjacent to, the site.	**Not Applicable**	Industry standard fauna friendly site design measures will be implemented along the road extent to reduce any physical risk posed by an increase in infrastructure in this area (**Plan A32** and **Section 5.2.8**).
e. Reduction in habitat connectivity to surrounding habitats, and any potential edge effects or disturbance to surrounding habitats.	<u>Connectivity</u> The only occurrence of the potential SEFFW TEC within the impact site was located in the south in association with Flagstone Creek. At present the vegetation endures some fragmentation resultant of the current road use. Connectivity values within the immediate landscape will be retained with the Flagstone Creek Corridor which east-west where the potential TEC was ground-truthed and confirmed to occur. <u>Edge Effects and Disturbance</u> The proposed development is not anticipated to create edge effects and disturbance. This is because an existing track exists which already presents edge effects and disturbance from 4WD vehicle use.	<u>Connectivity</u> Habitat connectivity from the site into the surrounding landscape is presently severed to the north, as well as partially to the west and south due to the presence of cleared areas to the west and south and residential developments to the north. While connectivity presently exists to the east, west and south EPBC determinations for development exist on these parcels (EPBC 2019/8412 and 2014/7206). Consequently, the allotments which are subject to an EPBC approval will not be retained as bushland into the future, thus reducing the availability and connectivity of habitat in the surrounding area. Following the commencement of construction on these allotments, bushland on-site will be wholly disconnected from habitat in the broader landscape. Connectivity values within the immediate landscape will be retained with the Flagstone Creek Corridor which east-west. No conservation areas adjoin the proposed development site. <u>Edge Effects and Disturbance</u>

Indirect Impact	Subtropical Eucalypt TEC	Fauna
		The proposed development is not anticipated to create edge effects and disturbance beyond that already existing. This is because an existing track exists which already presents edge effects and disturbance from 4WD vehicle use.
f. Changes to hydrology and water quality within, and around, the site, including increased siltation.	Flagstone Creek is located in the southern extent of the site on either side of the road parcel in association with this TEC. It must be noted that the creek is presently intersected due to the existing road use. For the areas of Flagstone Creek located east and west of the site. While earthworks on the road parcel may temporarily increase dust emissions and other changes to hydrology or water quality, it is considered that with implementation of standard mitigation measures, the project is likely to result in only a temporary and minor impact to ecological values due to the generation of dust.	It is not considered that this potential indirect impact to hydrology or water quality will have any impact on any fauna that happen to be utilising the site or local area.

5. Avoidance, Mitigation and Management Measures

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

The information available in the referral indicates that there is substantial area within the project footprint with protected matters present or likely to be present. The mitigation hierarchy is a process that is used to limit the amount of damage that a proposed action will have on the environment. There are three steps, and each step must be followed in order and to the greatest extent practicable before moving on to the next. These steps are:

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

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

Throughout this reporting the mitigation hierarchy has been utilised to minimise the amount of impact and ultimately damage the action will have on the environment. The steps have been followed and form an integrated approach to site selection through to mitigation and management measures. The mitigation hierarchy of; 1. Avoid, 2. Mitigate, and 3. Offset have been followed for the development to minimise potential impacts to MNES and their habitat. Discussions on the offsets are outlined in **Section 12** of this report.

Impact Avoidance

Item 5.1 of the PD Request asks to ***'demonstrate that you have applied the mitigation hierarchy and exhausted all options to avoid and mitigate harm to protected matters, before resorting to environmental offsets. In doing this, you must demonstrate that any avoidance or mitigation measures will provide ecological benefits to the species in the long-term. For example, on-site avoidance/conservation areas must be connected or provide connectivity opportunities for species in the broader landscape, and must include enduring mitigation of impacts from adjacent development'.***

Avoidance of impacts to environmental values has been a central element to the Proposed Action in both the initial planning process and the refined design process. The ways through which the Proposed Action demonstrates adoption of such avoidance measures are further described in the following sections.

5.1.1. Site identification for impact avoidance

The Site's location in GFPDA and its strategic location for the sequential expansion of existing urban development (recognised at both local and regional levels) is described within Section 2.6. Within the GFPDA, the Proponent defined the site through;

a) involvement of receptive landowners and community
b) identification of those parts of the GFPDA with fewer constraints and existing tracks that area cleared and modified.
c) the road exists and is in the ownership of QLD Gov as tenure for road reserve therefore no resumption of surrounding greenfield sites is required.
d) the road has been included in infrastructure planning dating back to 2012 and is embedded into all existing approvals already granted, inclusive of those which has previously obtained EPBC Act approval sign off, and
e) the site is strategically located between existing approvals and will create an arterial link north/south through the PDA, providing an essential link for public transport and emergency services route.

The Proponent has designed the Proposed Action in consideration with its mapped ecological values highlighted as part of the GFPDA Development Scheme (**Figure A3**), specifically Significant Vegetation. Major considerations for the Proponent included targeting locations in the GFPDA that were subject to historic urban and agricultural degradation and servicing a consolidated collection of properties in an appropriate and logical location. This initial Site identification process has achieved significant avoidance of ecological values that are present within the GFPDA and broader locality.

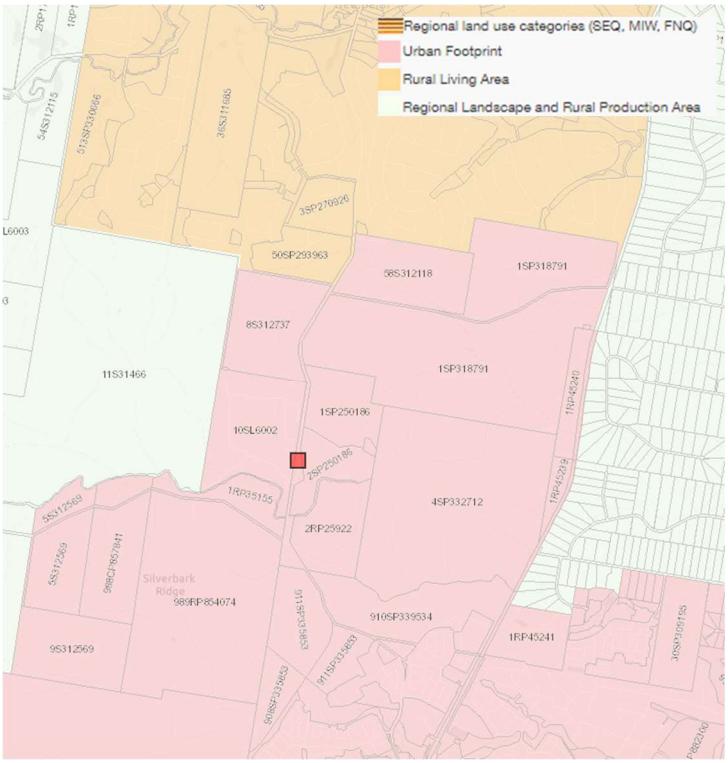
Currently there is no transit road corridor linkage north/south through the PDA. Through utilisation of the existing track and road in road reserve for the Proposed Action, other land with higher ecological significance will be avoided and the existing tenure for road will be retained. Site selection outside of the existing footprint would have a worse impact on ecological values, given no other existing lineal clearing (including partial road construction and dirt track) is present within the locality.

The road has been earmarked on the Greater Flagstone DCOP – Transport (road) Trunk Infrastructure Plans and is a future bus route, significantly reducing the need for residents to travel longer distances externally to the PDA. Furthermore, infrastructure planning dates back to 2012 and is embedded into all existing approvals already granted, inclusive of those which have obtained EPBC Act sign off. **Plan A3** shows the extensive EPBC approvals within the locality that will require access to the Proposed Action to commence works. Additionally, feasibility studies to support the development are included in **Appendix A5**.

The existing tenure of the development site is a road and exists in the ownership of the QLD Government as a road reserve exists for this purpose. Additionally, the QLD Government is providing significant funding for the road and requires control over the tenure on which it occurs, and no resumptions will be required for the project. As such the site is a logical location for the future road network.

5.1.2. Regional Scale

The State's Department of State Development, Infrastructure, Local Government and Planning administers Shaping SEQ – South East Queensland Regional Plan 2017 (Regional Plan)[6]. Under the Regional Plan, the site is within the Urban Footprint, similar to surrounding sites to the north, east, south and west and is intended to be developed for urban purposes into the future. Regionally significant greenspace, and biodiversity values are avoided through utilisation of the existing road alignment and easement. The Urban Footprint is strategically designed to manage future urban growth as compact and consolidated in established or future priority development areas rather than accommodating urban sprawl.



Inset 1 – Regional plan mapping identifying the site within the Urban Footprint

Source : Queensland Government, State Planning Policy Interactive Mapping System, accessed 19/3/24

5.1.3. Sub-regional Scale

At a sub-regional scale, EDQ has approved the Site's land use planning intent as governed by the GFPDA (Development Scheme). The Development Scheme identifies the site as a regional road under the transport network and is surrounded by land designated as urban living zone (**Figure A3**). The intent of the urban living zone is to accommodate a range of residential and non-residential land uses including;

- District centres and neighbourhood centres
- A community greenspace network including environmental areas and op space along waterways
- Employment and business areas

[6] ShapingSEQ South East Queensland Regional Plan 2023 (statedevelopment.qld.gov.au)

- Facilities and institutions including educational, child care and community facilities.

The proposed development will be integral in the delivery and provision of the above facilities and services for the future community due to designation and location in a PDA. The site is identified for future 'indicative public transport routes' as per *Map 3 – Centres and transport network*' of the GFPDA (**Figure A3**). The use of the site for the future road development reflects the intent of the PDA planning by QLD Government and Urban Land Development Authority (ULDA). Furthermore, the site is transacted by two waterways Flagstone Creek and Abrade Creek identified on GFPDA mapping as Biodiversity Corridors and areas of environmental significance see **Figure A3.**

The intent of the EDQ designation is for GFPDA to provide a development area accommodating the projected population growth and future employment and business source for emerging Regional Economic Clusters (RECs). The local authority, LCC is upgrading local infrastructure (roads and some stormwater), Urban Utilities is upgrading sewer and water, and Department of Main Roads and Transport is responsible for upgrading capacity and access to and from State Controlled Roads in the broader locality to meet the demands of this planned future development. LCC is supportive of the development in this area and intent for the PDA to accommodate future growth of the region for residential, employment and industrial purposes.

5.1.4. Alternative Sites

The preceding discussion demonstrates that the Proposed Action is appropriately positioned regarding the land use planning intent for the region, locality, and site, planned for and facilitated by QLD Government and ULDA. The site is instrumental in the orderly and sustainable urban design of the region, providing a main transport connection north/south, on land previously cleared and modified and utilised as a road. Therefore, it is an appropriately positioned development and the Proponent need not seek alternative sites. The ULDA and EPBC Act approvals already existing for surrounding sites confers this suitability and support (**Plan A3**).

This site has been chosen for the Proposed Action rather than other surrounding sites available in the region due to the following reasons:

- The site is located within the GFPDA which has been identified as a major employment and residential housing locality.
- The assessing authority for development applications within this PDA is ULDA. ULDA designated this site and surrounding land specifically for redevelopment to facilitate residential development activities which provide dormitory residences in the interim.
- The site is already utilised as an unsealed road and currently there is no other north/south route through the PDA. Utilisation of the existing cleared and modified track will result in less impact to other routes with higher ecological values.
- The road has been earmarked on the Greater Flagstone DCOP – Transport (road) Trunk Infrastructure Plans – the road is a bus route and significantly reduces the need for residents to trave longer distances through and externally to the PDA.
- Infrastructure planning dates back to 2012 and is embedded into all existing approvals already granted, inclusive of those which have obtained EPBC Act sign off (**Plan A3**).
- The existing tenure of the development is a road and exists in the ownership of the QLD Government, with the road reserve exists for this purpose.

Further, the GFPDA is strategically well positioned to leverage existing and proposed infrastructure and services within the LCC region, and development in proximity to established urban development makes logical and sequential sense. The site is essential in providing access to future tertiary and secondary schools, business and employment centres, and training facilities in GFUDA.

5.1.5. Historic Disturbance

Historically the land within the site and the broader GFUDA have been used as access tracks and unsealed roads, with surrounding lands subject to rural and agricultural land use including broadscale clearing for rural residential development, selective clearing and cropping. Section 3.2.1 of this report outlines the sites historical disturbance supported by aerial mapping. The site itself is identifiable as a road/track in earliest aerial mapping from 1955 through to current day. Land surrounding the site was influenced predominantly by agricultural activity to 1978 when more intensive forms of urban residential development commenced to the north, west and south east. The period 1978 to 1999 has seen further intensification of urban residential development to the north, north-west and west, and rural residential development to the east.

Contemporary photography shows extensive clearing and new residential development to the north of the site, and extensive clearing for agriculture and industry to the west and south. The impact of historic clearing remains evident on-ground today, most notably in the form of even-aged regrowth and a relative lack of mature and hollow-bearing trees in areas of proposed for permanent impact associated with the development. This lack of tree hollows has an implication for conservation-significant species that might otherwise be expected to occur (e.g., Greater Glider). The proposed development is focused on the historically disturbed areas, utilising an existing track subject to vehicle movement also adjoined in area by a powerline and easement.

5.1.6. Development Form

Engineering for the road has been undertaken to minimise the development footprint, road batters, and a minimal construction footprint (5m) to further avoid and minimise impact to environmentally significant areas. The development has been sited in a location already subject to clearing and modification for track/road, with alternative sites containing higher ecological value avoided. Further the road connection across waterways will feature fauna underpass alongside culvert or bridge design.

5.2 Avoidance and Mitigation

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

5.2.1. Description of avoidance measures

Item 5.2 (a) of the PD Request asks to provide "***a) description of avoidance measures that have been considered and applied. For example, project site selection to avoid valuable habitat, micro-siting of infrastructure to avoid impacts on habitat on site, or avoidance of any activity that may indirectly impact on essential lifecycle processes for species".***

As previously discussed within this PD Report and Section 5.1 above, the development is for future higher order road network, and has been located on modified and cleared land previously used as an unsealed road/track. Through the utilisation of parcel of land previously cleared and modified, impact to valuable habitat is minimised and avoided as far as practical.

Further, development has been maximised in parts of the site with lower ecological values (as identified by MHQA Site Condition Scores – **Appendix A13**) with higher values retained offsite in areas of biodiversity protection and connectivity through waterway corridors.

The waterways are identified as ecological / biodiversity corridors in the Planning Scheme and can incorporate rehabilitation into the future design to enhance and mitigate the impact. See Section 5.1 for further avoidance measures implemented into the proposed design.

5.2.2. Safeguards and mitigation measures

Item 5.2 (b) of the PD Request asks to provide ***b) A description of proposed safeguards and mitigation measures to minimise and manage relevant impacts of the action, with reference to relevant statutory or policy documents at the Commonwealth and State level (e.g., Guideline: State Development Assessment Provisions (State Code 25))***

Table A69: State Code 25 Response for Proposed Action

Performance outcomes and acceptable outcomes	Response
PO1 Development supports connectivity between highly connected patches of mapped koala habitat areas.	The development proposes to retain vegetation along waterway corridors helping to guide fauna through the locality, maintaining connectivity east to west. Waterway corridors will be treated with koala movement infrastructure in addition to fauna crossings above the road interspersed down the length of the Proposed Action. Koala exclusion and directional fencing is proposed to span the perimeter of the road and include stormwater reserve, featuring 1.8 m high aluminium perimeter / pool fencing (which is compliant with the Koala Sensitive Design Guidelines 66 (Department of Environment and Science 2022)), with no gaps at the base. Installation of koala fencing can be an EPBC approval condition. Compliance phase of the Proposed Action and performance of directional fencing can be measured through no occurrence of koala in the Development Footprint (the area of exclusion).
PO2 Development supports safe koala movement by preventing fragmentation of patches of mapped koala habitat areas.	The development is for an arterial road, continuing the existing tenure of the site of road. While koala habitat occurs surrounding the Proposed Action, the development will ensure the safe movement of Koala and other fauna between patches of mapped koala habitat to avoid fragmentation through fauna sensitive design measures.
PO3 Development within a mapped koala habitat area is undertaken in a way that prevents the risk of injury or death of koalas.	Clearing to be undertake in compliance with the Nature Conservation (Koala) Conservation Plan 2017, and therefore will be undertaken gradually and sequentially, directing any moving fauna towards retained corridor areas. A dedicated monitoring program will be implemented by the Proponent to enable the tracking of this performance criterion and can be conditioned as part of the EPBC approval.
PO4 Development does not compromise safe koala movement through impediments that restrict movements between highly connected patches of mapped koala habitat areas.	The Proposed Action is located adjoining existing EPBC approvals and will provide the future transit corridor network for the PDA. Waterway crossings will be designed to ensure safe Koala and fauna movement through fauna sensitive design and fauna infrastructure. Due to the proposal for road, exclusion fencing will line the site boundary, with fauna encouraged to utilise the fauna safe movement infrastructure into wildlife corridors surrounding the site.

Performance outcomes and acceptable outcomes	Response
PO5 Development is designed and sited to: 1. avoid impacts on matters of state environmental significance; or 2. minimise and mitigate impacts on matters of state environmental significance after demonstrating avoidance is not reasonably possible; and 3. provide an offset if, after demonstrating all reasonable avoidance, minimisation and mitigation measures are undertaken, the development results in an acceptable significant residual impact on a matter of state environmental significance.	As per Section 5 of this report the development has been designed and sited to avoid and minimise impact to MSES and MNES concurrently, and has been located in an area of the PDA that is currently utilised as a road, and is cleared and modified. Furthermore, the site is included in all surrounding approved developments for access and is required for construction stages. Through the utilisation of an existing road, impact of MSES and MNES has been minimised and avoided wherever possible. An offset will be provided for any SRI and can be conditioned as part of the EPBC approval process.

5.2.3. Pre-clearance and clearance procedures

Item 5.2 (c) of the PD Request asks to provide ***c) pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease***.

5.2.4. 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.

The Environmental Pre-Clearance Checklist is to be read in conjunction with the SBMP. Together the Environmental Pre-Clearance Checklist and subsequent attachments, and the SBMP will form the Environmental Pre-Clearance Package for that scope of works. Environmental Pre-clearance Packages require all approval documentation, including EPBC 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 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.

5.2.5. Fauna Spotter Catcher Roles and Reporting

As required by the SBMP, a DES registered Fauna Spotter Catcher must be appointed to ensure fauna management, specifically Koala 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 on-site during all times of construction. Under the Nature Conservation Act 1992 registered Fauna Spotter Catchers must complete a return of operations report to the Queensland State Government stating all fauna encountered and the specific management measures used to ensure the safety of native animals.

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

- 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 on-site in accordance with the Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016;
- Manage fauna habitat identified during the site inspection using the protocols discussed within the SBMP;
- Work in conjunction with a professional tree feller in the removal of any vegetation;

- Schedule vegetation clearing to ensure that the impacts on wildlife are minimised and the likelihood of detection and capture of wildlife is maximised and wildlife load reduction measures are productive;
- Ensuring vegetation and rubbish piles are not left to serve as refuge for displaced or roaming wildlife through the implementation of the following measures:
    - Immediately (within 12 hours) remove or destroy such material;
    - Erect wildlife proof barriers. Fencing surrounding stockpiles to prevent wildlife use; and
    - 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.

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. 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 site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- Results of any fauna surveys including pre-clearance surveys; and
- A wildlife and habitat impact assessment based on the proposed development works.

Action 3 – Prepare a Wildlife and Habitat Impact Mitigation Plan (WHIMP) Following completion and of the WPMP the Fauna Spotter Catcher 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 on-site during all phases of construction which involve potential impacts on wildlife or habitat. This will enable to the Fauna Spotter Catcher to make any necessary adjustments to cater for any specific issues encountered during the clearing works.

Action 6 – Post Works Reporting (Wildlife Management Report)

During the course of all site works, including the pre-clearance surveys, the Fauna Spotter Catcher is to keep an accurate record of all animals encountered, captured, incidents and disposals for each stage of the project. The records 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 (**Table A70**):

Table A70: Wildlife Management Report Details

1 - Wildlife Habitat Management Plan (WHMP)	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.

Table A70: Wildlife Management Report Details

2 - Wildlife Capture and Disposal Plan (WCDP)	1. Will contain the following details for each captured animals: 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) For released animals, location relative to point of capture
3 - Animal Injury and Euthanasia Report (AIER)	Similar details for the Wildlife Capture and Disposal Plan will be included in this report.

5.2.6. Vegetation Clearing and Fauna Management Plan

An overarching Vegetation Clearing and Fauna Management Plan (VCFMP) has been prepared to manage and mitigate potential impacts of the construction phase covering the loss of vegetated areas, isolated trees and likely barriers and impediments to local dispersal (refer **Appendix A14** for EPBC VCFMP). Further, separate fauna management measures will be implemented post-development to mitigate potential ongoing impacts to fauna, with specific measures for managing listed fauna (refer **Appendix A15** for EPBC Fauna Crossing Plan).

The VCFMP will include details on:

- trees marked for removal;
- all civil works likely to impact existing vegetation;
- temporary and permanent exclusion and protection fencing;
- stockpiling locations;
- links to weed management and revegetation proposals;
- species surveyed as using the site, focusing on those most likely impacted by development works;
- a list of relevant State and Commonwealth legislation constraints and controls for fauna potentially affected by development works;
- a plan showing existing habitat opportunities and locations;

- details of the threats to existing fauna species;
- a clearing sequence plan showing the commencement of clearing and direction of removal to allow for the appropriate flushing of fauna towards safe havens and/or the application of an appropriate relocation program;
- management and mitigation measures – i.e., temporary use of fauna exclusion fencing;
- description of fauna spotter role, contacts and certification; and
- specific fauna management procedures for potential or known habitat trees.

5.2.7. Description of buffers or proposed exclusion zones

Item 5.2 (d) of the PD Request asks for "**information on any buffer zones between the construction footprint and remaining habitat in the referral area and adjacent to the site**". The proposed action will be contained within the direct impact area as nominated on **Plan A1** and includes the referral area 100m from the extent of construction works for assessment purposes. The project is for a road utilising a previously cleared track and no works are proposed beyond the development area identified as direct impact. Fencing between the off-site land/habitat and the development area can occur as a condition of approval.

There is opportunity surrounding the proposed waterway crossing to implement fauna sensitive design, and plantings of relevant fauna food trees to encourage fauna movement along the proposed environmental corridors of the GFPDA lining the waterway corridors. Fauna sensitive design and landscape treatments including food trees within the waterway will discourage fauna movement through the development area.

Prior to the commencement of construction, the approved limit of works will be demarcated by surveyors to reduce the possibility of a breach of the approved development area boundary during construction works. Land beyond the boundary of the development 'impact area' shown on **Plan A1** does not form part of this project and is therefore an exclusion area.

5.2.8. Description of measures to address the risk of MNES entering developed areas

Item 5.2 (e) of the PD Request asks for "**Measures to address the risk of MNES entering developed areas, and becoming trapped/isolated without resources for shelter"**. Measures to minimise risk are further discussed following;

Fauna Friendly Road Design and Crossings

Fauna crossings identified as necessary proximal to the retained open space / waterway corridor areas, will be refined largely based on localised site ecological assessment identifying potentially impacted environmental matters and target species.

Any infrastructure that crosses the open space area will include fauna friendly crossings designed in accordance with the Fauna Sensitive Road Design Manual Volume 1 and 2 prepared by the Queensland Department of Transport and Main Roads (DTMR) and the Queensland Government Koala Sensitive Design Guidelines, or equivalent. As such fauna friendly crossings must include the following:

- Minimum fauna culvert sizes to suit a full suite of species onsite;

- Incorporate the use of fauna furniture;
- Provide crossing opportunities for arboreal animals;
- Demonstrate that the type and dimension of the fauna crossing ensures that during low flow events, one dry culvert exists to facilitate fauna movement;
- Where necessary, incorporate the installation of safe fauna crossing areas, including but not limited to appropriate fauna signage and fauna fencing; and
- Ensure fauna crossing details are determined in consultation with a hydraulic engineer.

Safe Passage Road Fauna Movement Solutions

Where internal roads within the project are required to cross waterways, specific fauna movement solutions will be incorporated into the design (**Plan A32**). These structures will be specifically selected, designed and sized to cater for the movement of native fauna anticipated to utilise the waterway corridors. Fauna crossings will be exclusively designed for fauna and separate to hydrology devices where possible. The safe crossing movement solutions will be supported by directional fauna exclusion fencing to ensure animals are funnelled away from vehicle conflicts and into the safe passage areas. Where required, additional large tree planting will be installed either side of a constructed road crossing to reinstate as quickly as possible a closed canopy over the new road infrastructure.

Fauna movement solutions will be implemented in accordance with the DTMR Fauna Sensitive Road Design Guidelines specifications and will include (Refer to **Appendix A15** for the EPBC Fauna Crossing Plan):

- Erection of signage specific to fauna crossing solutions and Koala crossing points
- Dedicated fauna culverts where possible
- Interconnecting logs for safe passage
- Elevated shelves for safe passage
- Refuge poles
- Temporary and permanent exclusion fencing
- Temporary escape poles prior to adjoining development and permanent escape poles in designated corridors

From the EPBC Fauna Crossing Plan (FCP) at **Appendix A15**, permanent fauna exclusion fencing and associated embellishments are proposed at EDQ endorsed ecological corridors, including Abrade Creek (**Appendix A15** Sheet 3), the northern tributary to Flagstone Creek (**Appendix A15** Sheet 5) and Flagstone Creek (**Appendix A15** Sheet 6). Notably, the northern tributary to Flagstone Creek is not considered a functional fauna corridor as per EPBC specifications due to its relatively limited dimensions, however, does represent a minor corridor under State assessment so includes some safe fauna movement solutions restricted by the prevailing topography relative to the larger corridors.

Outside of these locations, temporary fauna exclusion fencing and associated embellishments are proposed until such time as the adjoining State approved development areas are completed. The balance green areas on minor drainage lines present open space park land opportunities but are not considered to deliver functional fauna habitat and connectivity beyond landscape derived stepping stone functionality. All corridor areas and also open space parks adjoining the road have appropriate signage proposed (**Appendix A15**).

Following advice from the project engineers, for Abrade Creek the proposed fauna embellishments must be collocated with the flood culvert array as the prevailing topography, steep banks and level of cover to the road base do not allow for separate dedicated fauna culverts (**Appendix A15** Sheet 3). This not an unusual outcome under the DTMR Guidelines where prevailing topography prescribes what can practically be applied. The culvert array will meet or exceed specifications for ideal fauna movement opportunity as per the DTMR Guidelines (i.e. 3m box culverts). The northern tributary to Flagstone Creek allows opportunity for one dedicated fauna culvert on the northern bank and associated embellishments, although the size of this culvert is likely to be limited by expected cover (**Appendix A15** Sheet 5). Flagstone Creek provides opportunity for dedicated fauna culverts of ideal dimensions (3m box culverts) and associated embellishments on each bank (**Appendix A15** Sheet 6).

Item 5.2 (f) of the PD Request asks for "***Ongoing management of direct and indirect impacts due to increased likelihood of human presence, attacks by domestic dogs, and injury caused by negotiating various fence types*".**

Fencing

Fencing along the eastern and western boundaries of the road reserve at the interface of the retained bushland corridors will implement fauna-exclusion fencing to prevent fauna and identified MNES from entering the road reserve and becoming stranded. Fauna exclusion fences will keep MNES outside of the road reserve, and avoid and minimise injuries from vehicles.

Item 5.2 (g) of the PD Request asks for "***details of how speed reduction is to be achieved (e.g., traffic calming devices) and plans showing the locations of each of these features and the manner in which they will be implemented).***

Due to the Proposed Action being for an arterial road, traffic calming, and speed reduction devices will not be suitable as mitigation measures. Exclusion fencing will be utilised around the project footprint and adjoining waterway corridors to completely exclude fauna from the site.

Item 5.2 (h) of the PD Request asks for "**information on safe road design and placement, including installation of crossing warning signs, wildlife threshold marking on road (include maps and imagery**". Additionally Item 5.2 (i) of the PD Request asks for ***"the locations and size of any proposed fauna movement solutions, fire breaks, no-go or buffer zones (including buffers between the construction footprint or remaining habitat in the referral area and adjacent to the site), and potential fencing, including:***

- ***i. the location of any movement solutions, fire breaks, buffer zones, or fencing.***
- ***ii. the characteristics of the fauna movement solutions, fire breaks, buffer zones and fencing, (i.e., height, length, wildlife proof measures etc)***
- ***iii. whether the proposed measures, such as fencing will provide a wildlife barrier to/from/within the proposed action area.***

iv. When the movement solutions will be constructed, and whether there will be periods with no connectivity.

v. The maintenance intervals of the above measures.

vi. The consistency of the above measures with relevant federal, state or industry guidelines."

Responses to Item 5.2 (h) through (l) are collectively responded to below.

Fauna Friendly Road Design and Crossings

Road locations, setbacks and earthworks will occur to ensure the environmental values are protected and enhanced. It is expected fauna crossing to be identified and included within culvert/bridge design proximal to the retained open space environmental areas tracking the watercourse crossings (**Appendix A15**).

Crossing structures will be refined largely based on localised site ecological assessment identifying potentially impacted environmental matters and target species.

Any infrastructure that crosses the waterway corridor areas will include fauna friendly crossings designed in accordance with the DTMR Guidelines and the Queensland Government Koala Sensitive Design Guidelines, or equivalent (**Plan A32** and **Appendix A15**).

Fauna friendly crossings must include the following:

- Minimum fauna culvert sizes to suit a full suite of species onsite;
- Incorporate the use of fauna furniture;
- Provide crossing opportunities for arboreal;
- Demonstrate that the type and dimension of the fauna crossing ensures that during low flow events, one dry culvert exists to facilitate fauna movement;
- Where necessary, incorporate the installation of safe fauna crossing areas including but not limited to appropriate fauna signage and fauna fencing; and
- Ensure fauna crossing details are determined in consultation with a hydraulic engineer.

Safe Passage Road Fauna Movement Solutions

Where roads are required to cross waterways, specific fauna movement solutions will be incorporated into the design (**Appendix A15**). These structures will be specifically selected, designed, and sized to cater for the movement of native fauna anticipated to utilise the waterway corridors. Fauna crossings will be exclusively designed for fauna and separate to hydrology devices (with consideration of topography and water way barrier works requirements).

The safe crossing movement solutions will be supported by directional fauna exclusion fencing to ensure animals are funnelled away from vehicle conflicts and into the safe passage areas.

Fauna movement solutions will be implemented in accordance with the DTMR Fauna Sensitive Road Design Guidelines specifications and may include:

- Road signage to notify vehicles of the fauna linkage
- Erection of signage specific to fauna crossing solutions and Koala crossing points
- Additional plantings in narrowed road reserves to maximise connectivity
- Additional lighting (as required)
- Road design to support and funnel exclusion fencing
- Corridors and habitat connectivity

The waterway corridors transecting the site will include fauna sensitive design and infrastructure underpasses and fauna movement infrastructure is a key strategy for ensuring ongoing opportunities for exploiting open forest resources along the waterway corridor and conveying animals through the landscape. Further justification of this approach, discussing the planning and ecological contexts and evaluation of connectivity and potential 'pinch-points' is provided in **Plan A32** and **Appendix A15**.

Refer relevant plans;
Plan A29 – Ecological Corridors
Plan A30 – Koala Hospital Incident Locations
Plan A32 – Fauna Crossing Locations
Appendix A15 – EPBC Fauna Crossing Plan

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5.3.Mitigation Measure Assessment of Effectiveness

Item 5.3 of the PD Request asks to ***'Provide an assessment of the predicted effectiveness of each proposed avoidance or mitigation measure, noting that the effectiveness of a particular measure is a reflection of confidence in the anticipated outcome. The assessment of effectiveness should be evidence based and include examples of demonstrated success of a particular measure to achieve the desired avoidance/mitigation outcome'.***

Furthermore, item 5.4 of the PD Request asks ***'For each measure proposed, indicate the:***

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

A number of mitigation measures are proposed to reduce identified impacts on Koala and their habitat and include the following:

- Implementation of the site-specific Vegetation Management Plan and Fauna Management Plan

- Preparation of Environmental Pre-clearance Prestart Packages;
- On-site prestart meeting;
- Engagement of a DES registered fauna spotter catcher;
- Fauna-friendly fencing and design;
- Implementation of fauna friendly road design and signage where necessary; and
- Ongoing annual compliance reporting.

These measures are detailed within the following sub-sections and tables.

Table A71: Construction Impact Table Fauna

1. Loss of critical habitat for the listed fauna						
MNES	**Koala** Clearing and degradation of habitat is a recognised threat to Koala as per the conservation advice.	**GHFF** Clearing and degradation of habitat is a recognised threat to GHFF as per the recovery plan.	**Greater Glider** Clearing and degradation of habitat is a recognised threat to Greater Glider as per the conservation advice.	**Swift Parrot** Ongoing loss and degradation of foraging habitat is a recognised threat to Swift Parrot as per the recovery plan.	**Regent Honeyeater** Clearing and degradation of habitat is a recognised threat to Regent Honeyeater as per the recovery plan.	**Yellow-bellied Glider** Clearing and degradation of habitat is a recognised threat to Yellow-bellied Glider as per the conservation advice.
Avoidance and Mitigation Measures	No more than 23.3 hectares of vegetation identified as habitat critical to the survival of the Koala will be removed to facilitate the development. The removal of this vegetation is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on Koala. Further, connectivity potential will be retained from the site into the surrounding landscape, providing ongoing movement opportunity and benefits of connective habitat (e.g. safety). This will meet the key outcomes of the SBMP detailed in Section 5.1.4.	No more than 18.9 hectares of vegetation identified as habitat critical to the survival of the GHFF will be removed to facilitate the development. The removal of this vegetation is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on GHFF. Further, connectivity potential will be retained from the site into the surrounding landscape, providing ongoing movement opportunity and benefits of connective habitat (e.g. safety). This will meet the key outcomes of the SBMP detailed in Section 5.1.4.	No more than 75.3 hectares of vegetation and 245 hollow features identified as habitat critical to the survival of the Greater Glider will be impacted to facilitate the development. The removal of this vegetation and features is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on Greater Glider. Further, connectivity potential will be retained from the site into the surrounding landscape, providing ongoing movement opportunity and benefits of connective habitat (e.g. safety). This will meet the key outcomes of the SBMP detailed in Section 5.1.4.	No more than 187 key foraging features identified as habitat critical to the survival of the Swift Parrot will be removed to facilitate the development. The removal of these features is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on Swift Parrot. This will meet the key outcomes of the SBMP detailed in Section 5.1.4.	No more than 33 key foraging features identified as habitat critical to the survival of the Regent Honeyeater will be removed to facilitate the development. The removal of these features is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on Regent Honeyeater. This will meet the key outcomes of the SBMP detailed in Section 5.1.4.	No more than 75.3 hectares of vegetation and 245 hollow features identified as habitat critical to the survival of the Yellow-bellied Glider will be impacted to facilitate the development. The removal of this vegetation and features is considered unavoidable, and mitigation measures including a VCFMP will be employed to reduce the potential impacts of development on Yellow-bellied Glider. Further, connectivity potential will be retained from the site into the surrounding landscape, providing ongoing movement opportunity and benefits of connective habitat (e.g. safety). This will meet the key outcomes of the SBMP detailed in Section 5.1.4.
Evaluation of the Effectiveness of Measures	Ecological surveys and habitat assessment conducted across the site led to the precise spatial analysis of vegetation and habitat qualities. The project will result in the unavoidable loss of habitat for the listed species as discussed herein.					
Mitigation	Avoiding high value areas at development design.					
Timeline	Works complete.					
Risk Assessment	The field survey applied has accurately mapped the features that are to be avoided and retained within the Ecological Corridors. The development area is wholly contained within disturbed vegetation.					
Milestone	The Ecological Corridor is intact at completion of works, with mitigating factors outlined below effectively applied. The development area is cleared and developed.					

Table A71: Construction Impact Table Fauna

Residual Impact	Loss of habitat for the listed species impacted herein.					
2. Risk of injury or mortality to fauna from vegetation clearing and construction						
MNES	**Koala** Clearing of habitat is a recognised threat to Koala as per the conservation advice.	**GHFF** Clearing of habitat is a recognised threat to GHFF as per the recovery plan.	**Greater Glider** Clearing of habitat is a recognised threat to Greater Glider as per the conservation advice.	**Swift Parrot** Ongoing loss of foraging habitat is a recognised threat to Swift Parrot as per the recovery plan.	**Regent Honeyeater** Clearing of habitat is a recognised threat to Regent Honeyeater as per the recovery plan.	**Yellow-bellied Glider** Clearing of habitat is a recognised threat to Yellow-bellied Glider as per the conservation advice.
Avoidance and Mitigation Measures	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to Koalas. • Vegetation will be cleared sequentially. Clearing will be conducted so that Koala are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Temporary fauna friendly fencing will allow Koala to safely disperse into vegetated areas away from construction. • Temporary fauna exclusion fencing will then be erected to prevent Koala dispersing into construction areas. • Restricted construction hours (i.e., daylight 6am - 6pm)	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to GHFF. • Vegetation will be cleared sequentially. Clearing will be conducted so that GHFF are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Although no roosts are present and only foraging habitat is being cleared, sightings of roosting GHFF must be reported and consideration given to the potential for heat stress events as per the Flying-fox Heat Stress Forecaster available at animalecologylab.org.	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to Greater Gliders. • Vegetation will be cleared sequentially. Clearing will be conducted so that Greater Glider are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Temporary fauna friendly fencing will allow Greater Glider to safely disperse into vegetated areas away from construction, • Noting they are highly susceptible to disturbance as per the conservation advice, temporary fauna exclusion fencing will then be erected to prevent Greater Glider	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to Swift Parrot. • Vegetation will be cleared sequentially. Clearing will be conducted so that Swift Parrot are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Restricted construction hours (i.e., daylight 6am - 6pm) • Prohibition of companion / security animals (e.g. dogs). In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site.	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to Regent Honeyeater. • Vegetation will be cleared sequentially. Clearing will be conducted so that Regent Honeyeater are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Restricted construction hours (i.e., daylight 6am - 6pm) • Prohibition of companion / security animals (e.g. dogs). In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site.	All clearing will be undertaken in accordance with the Site Based Management Plan (SBMP). 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 endorsed by the Australia Zoo Wildlife Warriors and Voiceless (The Draft Code). The role of the Fauna Spotter Catcher is to mitigate the risk of injury or deaths to Yellow-bellied Glider. • Vegetation will be cleared sequentially. Clearing will be conducted so that Yellow-bellied Glider are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Temporary fauna friendly fencing will allow Greater Glider to safely disperse into vegetated areas away from construction, • Temporary fauna exclusion fencing will then be erected to prevent Yellow-bellied Glider dispersing into construction areas.

Table A71: Construction Impact Table Fauna

	• Prohibition of companion / security animals (e.g. dogs). • Restricted vehicle speeds (e.g. max 40 km/hr) within construction areas. In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site. As part of this training all personnel will be instructed on their obligations in regard to vehicle movement and construction speed limits.	• Restricted construction hours (i.e., daylight 6am - 6pm) In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site. As part of this training all personnel will be instructed on their obligations in regard to GHFF sightings.	dispersing into construction areas. • Restricted construction hours (i.e., daylight 6am - 6pm) • Prohibition of companion / security animals (e.g. dogs). In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site.			• Restricted construction hours (i.e., daylight 6am - 6pm) • Prohibition of companion / security animals (e.g. dogs). In addition to this, all construction personnel will attend environmental training as part of the site induction process prior to entering the work site.

Evaluation of the Effectiveness of Measures

The use of a Fauna Spotter Catcher throughout clearing is an effective tool to:

1. Identify they types of species on-site prior to clearing; and
2. Identify and flag habitat features that require thorough examination before clearing.

Fauna Spotter Catchers have a primary role to ensure no fauna are in vegetation before it is cleared.. As such, it is extremely unlikely that listed fauna will be killed or injured during vegetation clearing, particularly given the onerous and thorough procedures adopted from the Draft Code.

The sequential clearing of vegetation will allow for the gradual loss of vegetation, giving fauna time to naturally disperse away from the disturbance. The use of fauna exclusion fencing around construction areas will ensure fauna do not disperse into unsafe, hostile areas, again minimising the risk of injury or death.

Each of these measures will ensure that the risk of injury or death to fauna as a result of construction are avoided and mitigated. The aim of these procedures is to mitigate injuries or death to listed species due to construction.

Mitigation	Timeline	Risk Assessment	Milestone	Residual Impact
Fauna Spotter Catcher	Present at all times during clearing works	Fauna Spotter Catcher not present and listed fauna injured or killed	Mitigate injury or death to listed fauna during clearing	The use of a Fauna Spotter Catcher is mandated. **No residual impact**
Sequential clearing	At all times during clearing	Sequential clearing not undertaken, and fragmentation induced.	Clearing completed as per sequential clearing	Sequential clearing is mandated and guided by VC&FMP and pre-clearance checklists and pre-starts. **No residual impact**
Heat Stress	At all times during clearing	Grey-headed Flying-fox roosting not reported.	Clearing completed without heat stress to Grey-headed Flying-fox.	If Grey-headed Flying-foxes are sighted roosting, heat stress monitoring is implemented. **No residual impact**
Temporary fauna fencing	At all times during clearing	Temporary fencing not applied, and listed fauna are injured or killed	Temporary fencing utilised at all times during the clearing process	Temporary fauna fencing is mandated and guided by SBMPs and preclearance checklists and pre-starts. **No residual impact**

Table A71: Construction Impact Table Fauna

	Restricted construction hours	At all times during construction	Works outside of hours	Works area completed within mandated hours	Works hours are mandated and guided by the SBMP. **No residual impact**
	Dog prohibitions	At all times during construction	No companion and security dogs on-site	Construction completed without dogs on-site	Dog controls are mandated and guided by the SBMP. **No residual impact**
	Low vehicle speeds	At all times during construction	Speeds are exceeded resulting in fauna strike	Construction completed without vehicle strike	Speed limits are mandated and guided by the SBMP. **No residual impact**
	Site inductions	At all times during construction	Induction avoided	Construction completed without inductions being breached.	Inductions are mandated and guided by the SBMP. **No residual impact**

3. Risk of disturbance to fauna when foraging in habitat during construction

MNES	**Koala**	**GHFF**	**Greater Glider** Greater Glider is highly susceptible to disturbance as per the conservation advice.	**Swift Parrot**	**Regent Honeyeater**	**Yellow-bellied Glider**
Avoidance and Mitigation Measures	• Timing vegetation clearing to minimise impacts (direct or indirect) during optimum breeding periods. • Monitoring of foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Staged clearing of vegetation will allow for the gradual loss of vegetation, giving Koala time to naturally disperse away from the disturbance.	• Monitoring of foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Sighting of roosting GHFF and implementation of heat stress protocols. • Timing vegetation clearing to minimise impacts (direct or indirect) during optimum breeding periods for roosting GHFF. • Staged clearing of vegetation will allow for the gradual loss of vegetation, giving fauna time to naturally disperse away from the disturbance. •	• Timing vegetation clearing to minimise impacts (direct or indirect) during optimum breeding periods. • Monitoring of denning and foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Staged clearing of vegetation will allow for the gradual loss of foraging and shelter habitat, giving Greater Glider time to naturally disperse away from the disturbance.	• Monitoring of foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Staged clearing of vegetation will allow for the gradual loss of vegetation, giving Swift Parrot time to naturally disperse away from the disturbance	• Monitoring of foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Staged clearing of vegetation will allow for the gradual loss of vegetation, giving Regent Honeyeater time to naturally disperse away from the disturbance	• Monitoring of denning and foraging trees by the Fauna Spotter Catcher, and including appropriate clearing controls / management where required to minimise disturbance. • Staged clearing of vegetation will allow for the gradual loss of foraging and shelter habitat, giving Yellow-bellied Glider time to naturally disperse away from the disturbance.
Evaluation of the	Limiting hours of construction and clearing to daylight hours only (e.g. 6am-6pm), allows a 12-hour period for safe dispersal and foraging to occur. With appropriate monitoring of observed feed and shelter trees by the Fauna Spotter Catcher no residual impacts are expected to occur.					

Table A71: Construction Impact Table Fauna

Effectiveness of Measures						
Mitigation	Hours and site inductions.					
Timeline	Applicable at all times during construction.					
Risk Assessment	Foraging and shelter opportunities.					
Milestone	Risk of injury or death to listed fauna during clearing mitigated, and works area completed within mandated hours.					
Residual Impact	No residual impact.					
4. Fragmentation of habitat for fauna during construction						
MNES	**Koala**	**GHFF**	**Greater Glider** Greater Glider is highly susceptible to disturbance as per the conservation advice.	**Swift Parrot**	**Regent Honeyeater**	**Yellow-bellied Glider**
Avoidance and Mitigation Measures	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow Koala to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes Koala into connected areas of habitat and will avoid flushing Koala into fragmented or hostile areas. Specifically: • Koala are not required to cross roads or move through developed or disturbed areas, such as residential areas of areas that require	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes GHFF into connected areas of habitat and will avoid flushing GHFF into fragmented or hostile areas. If GHFF are roosting, heat stress factors are to be taken into account. Specifically: • GHFF are highly mobile. • GHFF are not left occupying an 'island' of habitat between hostile environments;	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow Greater Glider to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes Greater Glider into connected areas of habitat and will avoid flushing Greater Glider into fragmented or hostile areas. Specifically: • Greater Glider are not required to cross roads or move through developed or disturbed areas, such as residential areas of areas that	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow Swift Parrot to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes Swift Parrot into connected areas of habitat and will avoid flushing Swift Parrot into fragmented or hostile areas. Specifically: • Swift Parrot are highly mobile; • Swift Parrots are not left occupying an 'island' of habitat between hostile	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow Regent Honeyeater to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes Regent Honeyeater into connected areas of habitat and will avoid flushing Regent Honeyeater into fragmented or hostile areas. Specifically: • Regent Honeyetaers are highly mobile; • Regent Honeyeaters are not left occupying an 'island' of	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow Yellow-bellied Glider to disperse from construction areas. Clearing procedures that avoid the fragmentation of vegetation will be adopted within the SBMP and informed by the Fauna Spotter Catcher WHIMPs. Clearing will be undertaken in a way that flushes Yellow-bellied Glider into connected areas of habitat and will avoid flushing Yellow-bellied Glider into fragmented or hostile areas. Specifically: • Yellow-bellied Glider are not required to cross roads or move through developed or disturbed areas, such as

Table A71: Construction Impact Table Fauna

	movement greater than 100 m over cleared ground to reach suitable habitat; • Koala are not left occupying an 'island' of habitat between hostile environments, such as road and cleared areas; • Koala can safely leave the site of clearing and relocate to adjacent habitat; • Demarcation fencing will be fauna friendly to ensure Koala are not trapped within the proposed cleared extent; and • Cleared vegetation is to be stockpiled as to not impede Koala movement. Additionally, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas.	• GHFF can safely leave the site of clearing and relocate to adjacent habitats. • No clearing where roosting GHFF occur without noting heat stress management requirements.	require movement greater than 100 m over cleared ground to reach suitable habitat; • Greater Glider are not left occupying an 'island' of habitat between hostile environments, such as road and cleared areas; • Greater Glider can safely leave the site of clearing and relocate to adjacent habitat; • Demarcation fencing will be fauna friendly to ensure Greater Glider are not trapped within the proposed cleared extent; and • Cleared vegetation is to be stockpiled as to not impede Greater Glider movement. Additionally, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas.	environments, such as road and cleared areas; • Swift Parrots can safely leave the site of clearing and relocate to adjacent habitat.	habitat between hostile environments, such as road and cleared areas; • Regent Honeyeaters can safely leave the site of clearing and relocate to adjacent habitat.	residential areas of areas that require movement greater than 100 m over cleared ground to reach suitable habitat; • Yellow-bellied Glider are not left occupying an 'island' of habitat between hostile environments, such as road and cleared areas; • Yellow-bellied Glider can safely leave the site of clearing and relocate to adjacent habitat; • Demarcation fencing will be fauna friendly to ensure Yellow-bellied Glider are not trapped within the proposed cleared extent; and • Cleared vegetation is to be stockpiled as to not impede Yellow-bellied Glider movement. Additionally, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas.

Evaluation of the Effectiveness of Measures

Habitat isolation and fragmentation is a primary concern due to its impacts on fauna. Arboreal fauna are able to disperse through a variety of environs, including bushland and cleared areas connected through waterway corridors. The direction of clearing of vegetation in accordance with the SBMP (informed by WHIMPs) will ensure that clearing does not create fragmented habitat islands that could trap fauna. Rather, procedures will be in place to ensure clearing flushes fauna away from construction areas into surrounding habitat areas that are connected to the wider landscape. Adjoining areas are permanently designated as Conservation, and thus will not be subject to fragmentation in the future. As such. No residual impacts are anticipated.

Mitigation	Timeline	Risk Assessment	Milestone	Residual Impact
<u>Fauna not fragmented from adjoining habitat during clearing.</u>	Sequential clearing is undertaken at all times during vegetation clearing strategically to retain connectivity.	Fauna are fragmented from adjoining habitat by clearing.	Clearing completed without fauna being fragmented.	Sequential clearing is mandated and guided by SBMP and pre-clearance checklists and pre-starts. **No residual impact**
<u>Heat Stress</u>	At all times during clearing	Grey-headed Flying-fox roosting not reported.	Clearing completed without heat stress to Grey-headed Flying-fox.	If Grey-headed Flying-foxes are sighted roosting, heat stress monitoring is implemented. **No residual impact**

Table A71: Construction Impact Table Fauna

	Temporary fauna fencing	At all times during clearing	Temporary fencing not applied, and listed fauna are injured or killed.	Temporary fencing utilised at all times during the clearing process	Temporary fauna fencing is mandated and guided by SBMPs and preclearance checklists and pre-starts. **No residual impact**
	Stockpiling of cleared vegetation facilitates safe fauna movement	At all times during clearing	Stockpiling creates a barrier to fauna.	Stockpiling is undertaken as guided by SBMP	Safe stockpiling is mandated and guided by SBMP and pre-clearance checklists and pre-starts. **No residual impact**
	Safe fauna crossings during construction	At all times during construction	Fauna strike occurs at crossing location.	No fauna strikes during construction	Fauna 'go slow' and fencing measures are applied at corridor crossings as per the SBMP and pre-clearance checklists and pre-starts. **No residual impact**
	Low vehicle speeds	At all times during construction	Speed limits are breached resulting in fauna strike.	No speed limit breaches during construction.	Speed limits are mandated and guided by the SBMP. **No residual impact**
5. Disturbance to fauna during construction					
Avoidance and Mitigation Measures	Light and Noise Restricted construction hours (e.g. 6am-6pm) will limit disruption from light and noise impacts, as well as allow a 12 hour period for fauna to disperse and forage. Contamination, weeds and pathogens Construction activities increase the risk of weeds, pathogens and contamination into the site. To manage these impacts, a Weed and Pathogen Management Plan will be prepared to identify potential weed species, and include appropriate controls for weed and pathogen management, disposal and monitoring. Weeds will be actively managed within the construction footprint and disposed of appropriately. No companion animals (e.g. dogs) will be allowed within construction areas. Vehicle disturbance Reduced vehicle speeds will be implemented throughout the construction area to minimise vehicle disturbances. Further, proposed construction roads will be subject to design treatments to ensure safe fauna crossing opportunities are maintained to vegetated areas and impose low vehicle speeds within construction areas. Barriers to dispersal Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. Temporary fauna friendly fencing will allow fauna to safely disperse into vegetated areas while clearing. Temporary fauna exclusion fencing will then be erected to prevent fauna dispersing into construction areas. Contractor management All construction personnel will attend environmental training as part of the site induction process prior to entering the work site. As part of this training, all personnel will be instructed on their obligations in regard to vegetation clearing protocols and to protect native fauna. Additional controls for listed fauna will be presented in a toolbox talk.				
Evaluation of the Effectiveness of Measures	Construction management and clearing controls implemented by the SBMP are considered to be able to effectively avoid, minimise and mitigate risk of disturbance to fauna activities during construction, and allow for adaptive management where required. Limiting hours of construction and clearing to daylight hours, allows a 12-hour period for safe dispersal. With appropriate monitoring, pre, during and post construction by the Fauna Spotter Catcher, no residual impacts area expected to occur.				
	Mitigation	**Timeline**	**Risk Assessment**	**Milestone**	**Residual Impact**
	Minimise light and noise disturbance.	At all times during construction.	Light and noise impacts on fauna.	Light and noise disturbance is limited to daylight hours.	Light and noise restrictions mandate work between 6am and 6pm in the SBMP. **No residual impact**

Table A71: Construction Impact Table Fauna

	The risk of contamination and exacerbating weeds and pathogens is minimised	At all times during construction.	Contamination, weed and pathogen incursion.	Contamination and weed and pathogen incursions do not occur	The SBMP will mitigate the risk of contamination and weed and pathogen incursion. **No residual impact.**
	Vehicle disturbance minimised	At all times during construction.	As above	As above	As above. **No residual impact.**
	Barriers to dispersal are not created	At all times during construction.	As above	As above	As above. **No residual impact.**
	Temporary fauna fencing	At all times during construction.	As above	As above	As above. **No residual impact.**
	Inductions and training	At all times during construction.	As above	As above	As above. **No residual impact.**
	Adaptive management	At all times during construction	Adaptive management not applied	Adaptive management utilised if required	The SBMP will include adaptive management strategies to avoid recurrence of adverse incidents. **No residual impact**
Mitigation	SBMP				
Timeline	Applicable at all times during construction.				
Risk Assessment	Fauna disturbance.				
Milestone	Fauna disturbance during construction mitigated, and works area completed within mandated hours.				
Residual Impact	No residual impact.				
6. Hydrological changes					
Avoidance and Mitigation Measures	• Stormwater detention technologies will be utilised to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. • All work will be undertaken in accordance with appropriate management plans to ensure the hydrological changes across the site do not impact on surrounding vegetation.				
Evaluation of the Effectiveness of Measures	The implementation of a project wide Stormwater Management Plan as designed by certified engineers ensures that hydrological change area appropriately accounted for and managed. These management measures will reduce impacts from higher levels of surface water flow caused by hardstand areas and ensures natural drainage lines continue to function as they naturally would have. Stormwater detention basins prevent localised flooding of drainage lines and waterways caused by increased runoff over hardstand areas and also contribute to maintaining water quality levels.				
Mitigation	Hydraulic and Stormwater Management Plan.				
Timeline	To be approved prior to works.				

Table A71: Construction Impact Table Fauna

Risk Assessment	Unforeseen hydrological changes.		
Milestone	No worsening of hydrological impacts as a result of the development.		
Residual Impact	The Hydraulic and Stormwater Management Plan is being compiled by Hydraulic Engineers and must be approved by the State. **No residual impact.**		
7. Risk of injury of death to fauna from vehicle strike			
MNES	**Koala** Vehicle strike is a recognised threat to Koala as per the conservation advice.	**Greater Glider**	**Yellow-bellied Glider**
Avoidance and Mitigation Measures	Measures will be imposed to avoid and mitigate the risk of fauna being hit by vehicles. These measures include: • Installation of fauna movement solutions and wildlife crossing awareness signage where roads cross waterways. • Erection of fauna awareness signage along the road to raise awareness of the species' presence in the area.	Measures will be imposed to avoid and mitigate the risk of fauna being hit by vehicles. These measures include: • Installation of fauna movement solutions and wildlife crossing awareness signage where roads cross waterways. • Erection of fauna awareness signage along the road to raise awareness of the species' presence in the area.	Measures will be imposed to avoid and mitigate the risk of fauna being hit by vehicles. These measures include: • Installation of fauna movement solutions and wildlife crossing awareness signage where roads cross waterways. • Erection of fauna awareness signage along the road to raise awareness of the species' presence in the area.
Evaluation of the Effectiveness of Measures	The purpose of these avoidance and mitigation measures is to minimise the risk of injury or death to fauna from vehicle strike. It will be important to minimise the incentive for fauna to enter road areas by restricting the availability of habitat in these areas. As such, street scaping will not be planted with suitable habitat, which will in turn encourage fauna to stay away from the road area. In addition, awareness signage will ensure motorists are aware that fauna have potential to occur in the area, making them more conscious of potentially dispersing fauna and encouraging them to maintain a low vehicle speed. Wildlife movement solutions have been identified as an effective tool to mitigate the effects of fragmentation caused by roads and fauna friendly road design for infrastructure that crosses the Ecological Corridor. In essence, wildlife crossings will include the following elements: • Wildlife crossing signage • Vegetation adjoining the road • Signage to raise driver awareness • Where seen supportive of the crossing outcomes the inclusion of specific lighting regimes • Exclusion fencing funnelling animals towards the safest road crossing point • Refuge poles • Escape poles Overall, these tools are considered to be effective measures to reduce the risk of injury or death of fauna from vehicle strike. They have been officially adopted numerous times by the Queensland State Government in similar road conflict scenarios and are espoused as one of the most effective solutions. The purpose of these measures is to enable the objective of no injury or death to fauna as a result of vehicle strike. No residual impacts can be identified.		

Mitigation	**Timeline**	**Risk Assessment**	**Milestone**	**Residual Impact**
Lineal waterway / creek Corridor greenspace	To be delivered post development.	Rehabilitation to waterway not delivered.	Rehabilitation not delivered.	**No residual impact**

Table A71: Construction Impact Table Fauna

	Reduced vehicle speeds	On construction of roads	Vehicles not abiding by speed limit.	Fauna deaths from vehicle Strike mitigated.	Low vehicle speeds for construction will be signed and enforced as for public roads. **No residual impact.**
	Wildlife awareness signage	On construction of roads and lineal park buffering.	Signs not installed	Signs installed	Wildlife awareness signage will be delivered under the SBMP. **No residual impact.**
	Urban landscaping avoids Koala	At construction	Potentially suitable habitat trees inadvertently utilised in road areas.	Urban landscaping delivered with species not known to be preferred by Koala, Greater Glider and Yellow-bellied Glider.	**No residual impact.**

8. Risk of injury or death from dog attack	
MNES	**Koala** Dog attack is a recognised threat to Koala as per the conservation advice.
Avoidance and Mitigation Measures	Signage to indicate dog on leash only within footpath areas will be located around the impact site, with fauna exclusion fencing.
Evaluation of the Effectiveness of Measures	The impact area and buffer is proposed for a high traffic road reserve, no contributory risk of injury from dog attack is deemed to occur by the action.
Mitigation	Exclusion fencing, signage, on leash only areas
Timeline	As above
Risk Assessment	As above
Milestone	As above
Residual Impact	**No residual impact.**

9. Creation of barriers to dispersal/ Fragmentation of Habitat			
MNES	**Koala** Clearing and degradation of habitat is a recognised threat to Koala as per the conservation advice.	**Greater Glider** Clearing and degradation of habitat is a recognised threat to Greater Glider as per the conservation advice.	**Yellow-bellied Glider** Clearing and degradation of habitat is a recognised threat to Yellow-bellied Glider as per the conservation advice.
Avoidance and Mitigation Measures	• The waterway corridors will retain existing vegetation for Koala wherever possible.	• The waterway corridors will retain existing vegetation for Greater Glider wherever possible.	• The waterway corridors will retain existing vegetation for Yellow-bellied Glider wherever possible.

Table A71: Construction Impact Table Fauna

	• However, due to pre-existing EPBC determinations earmarked across connected bushland, following the commencement of development under these approvals, the area of the habitat that the site will be connected to will be reduced. Consequently, maintaining connectivity or encouraging fauna movement throughout the development area is not considered appropriate, and instead the retained riparian corridors will provide the primary habitat across the locality. • While the expanse of areas available for movement will be reduced through surrounding residential development and widening of the existing road, the creek crossings and safe movement solutions ensure that habitat remains connected, avoiding fragmenting or isolating suitable habitat within the adjoining creek lines.	• However, due to pre-existing EPBC determinations earmarked across connected bushland, following the commencement of development under these approvals, the area of the habitat that the site will be connected to will be reduced. Consequently, maintaining connectivity or encouraging fauna movement throughout the development area is not considered appropriate, and instead the retained riparian corridors will provide the primary habitat across the locality. • While the expanse of areas available for movement will be reduced through surrounding residential development and widening of the existing road, the creek crossings and safe movement solutions ensure that habitat remains connected, avoiding fragmenting or isolating suitable habitat within the adjoining creek lines.	• However, due to pre-existing EPBC determinations earmarked across connected bushland, following the commencement of development under these approvals, the area of the habitat that the site will be connected to will be reduced. Consequently, maintaining connectivity or encouraging fauna movement throughout the development area is not considered appropriate, and instead the retained riparian corridors will provide the primary habitat across the locality. • While the expanse of areas available for movement will be reduced through surrounding residential development and widening of the existing road, the creek crossings and safe movement solutions ensure that habitat remains connected, avoiding fragmenting or isolating suitable habitat within the adjoining creek lines.
Evaluation of the Effectiveness of Measures	The development will create barriers to movement in the form of vegetation clearing, roads, fences, and other infrastructure. However, due to surrounding pre-existing EPBC determinations the site will be consequently connected to less habitat with fauna habitat limited to the retained waterway corridors. Maintaining connectivity or encouraging fauna movement throughout this site via the road is not considered appropriate and rather fauna will be facilitated to utilise fauna safe infrastructure and the waterway corridors. While the expanse of areas suited for movement are to be reduced through development, the riparian corridors will provide fauna foraging habitat into perpetuity.		
Mitigation	Creation of fragmented habitat unavoidable and mitigated through fauna safe movement opportunities, noting also to surrounding land uses.		
Timeline	As above		
Risk Assessment	As above		
Milestone	As above		
Residual Impact	Creation of fragmented habitat unavoidable due to surrounding land uses.		
10. Disturbance to fauna habitat in retained corridors during operation			
	The SBMP will include controls to avoid, minimise and mitigate risk of disturbance to MNES habitat during operation, specifically: <u>Light and noise disturbance</u> • Detailed design layout will adopt fauna sensitive urban design measures, specifically adjoining conservation and waterway corridors including avoiding street lighting backing and within close proximity to waterway corridors and conservation areas. <u>Contamination, weeds and pathogens</u> • Landscaping mix to be primarily native species and avoid Koala-preferred species • Lifestyle guidelines to surrounding development include information on suggested planting mix and weed management <u>Vehicle disturbance</u>		

Table A71: Construction Impact Table Fauna

- Fencing provided on sides of road along development footprint to minimise edge effects
- Design and construct fauna movement where crossings intersect waterway corridors
- Roadside vegetation management measures are to be undertaken at key locations to increase visibility of wildlife entering the roadway
- Implement measures to improve driver awareness including installation of wildlife awareness signage
- Additional lighting (as required)
- Additional exclusion fencing (as required)

Barriers to dispersal

- Fauna exclusion fencing as required

Public awareness

- Wildlife awareness signage at fauna crossings and located near waterways

The action, once in operation, has the potential, (although minimal compared to construction) to cause disturbance to fauna habitat. Adopting fauna sensitive design and wildlife movement solutions will minimise disturbance from the action.

Rehabilitation efforts adjacent to the impact will be undertaken as well as appropriate controls for weed management. These measures are effective in discouraging fauna to enter the road reserve and rather travel through the waterway corridor and future conservation areas.

Implementation of the DTMR Fauna Sensitive Road Design Manual measures for Fauna are effective measures for minimising risk of vehicle strike (as discussed previously). As part of management of the mitigating impacts of the development on retained vegetation in the waterway corridor, fauna exclusion fencing, as per DTMR and Koala Sensitive Urban Design Guidelines specifications, will be installed to ensure safe movement for fauna as far as practicable, including appropriately restrict wildlife from re-entering the impact areas. Fauna exclusion fencing is a known effective mitigation measure to create a barrier between retained habitat and key threats. This will work alongside fauna friendly infrastructure that will provide a safe pathway for fauna to move within the locality.

As the development will be surrounded either by fauna exclusion fencing or existing/approved residential development, disturbance to fauna habitat is limited to direct impacts from clearing, with indirect impacts considered to be appropriately managed. No residual impacts are anticipated outside the development footprint.

Mitigation	**Timeline**	**Risk Assessment**	**Milestone**	**Residual Impact**
Fauna crossings	As above	As above	As above.	**No residual impact.**
Signage	As above	As above	As above.	**No residual impact.**

Table A72: Construction Impact Table TEC

Construction Phase - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered	
Construction Phase - Vegetation clearing and earthworks	
Risk 1 : Removal of approx. 1.5 ha of vegetation within the SEFFW TEC, resulting in a reduction in the community.	
Pre-mitigation Risk Assessment	**Moderate.** Vegetation will be unavoidably removed from within the subtropical eucalypt floodplain forest and woodland TEC to facilitate construction the Proposed Action. Exclusion areas will be well signed and sectioned off to ensure development boundary is not increased.
Avoidance and Mitigation Measures	• VCFMP (to be updated at detailed design). • Preliminary CEMP (to be completed at detailed design).
Responsible entity	The proponent, engaged civil contractor, fauna spotter catcher and environmental superintendent.
Evaluation of the Effectiveness of Measures	The proposal will result in the unavoidable removal of native vegetation within the subtropical eucalypt floodplain forest and woodland. This area has been minimised to the greatest extent possible through consultation with bridge engineer specialists providing and amended bridge design and CEMP. The smallest area possible will be impacted, and rehabilitation in this location will occur post-construction.
Risk assessment	**Low.** Significant impact considered highly unlikely from the removal of this vegetation and clearing processes.
Performance Criteria Milestone	**Implementation of the VCFMP and CEMP**
Timeline	Applicable at all times during construction.
Residual Impact	**No residual impact**
Risk 2 : Fragmentation of habitat critical for the survival of threatened ecological communities and fauna species.	
Pre-mitigation Risk Assessment	**Moderate.** Works associated with construction of the regional road will result in the removal of the TEC. However, the TEC is already heavily fragmented, a road and cleared track currently exists in the same location but the development will exacerbate the fragmentation.

Construction Phase - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered	
Avoidance and Mitigation Measures	• VCFMP (to be updated at detailed design). • CEMP (to be completed at detailed design). • Consolidation of retained habitat in waterway crossings of site
Responsible entity	The proponent, engaged civil contractor, fauna spotter catcher and environmental superintendent.
Evaluation of the Effectiveness of Measures	The project has been specifically workshopped and designed to avoid fragmentation of habitat. Construction where completed in accordance with the avoidance and mitigation measures is unlikely to fragment habitat across the site and abutting land.
Risk assessment	**Low.** Construction in accordance with the avoidance and mitigation measures will reduce the risk.
Performance Criteria Milestone	Implement CEMP and VCMP.
Timeline	Throughout construction
Residual Impact	No Significant residual impact not expected as a result of the activity.
Risk 3 : Impacts from erosion and sedimentation.	
Pre-mitigation Risk Assessment	**Moderate.** The referral area demonstrates an existing modified hydrological regime. Historical and current land uses including roads, agricultural use and cropping have resulted in previous voids to be filled with water rather than rehabilitated to preclear vegetation. As a result of historical modification, there is already an increase in erosion adjoining areas of waterway corridor and TEC. Pollutants and sediment loads already leave the site facilitated by existing drainage features and overland flow paths.

Construction Phase - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered	
Avoidance and Mitigation Measures	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 will be timed and staged to minimise the time and extent to which soil is exposed to water and wind. - Water within the site will be diverted around areas where soil has been disturbed and stockpiles, and flow velocities will be minimised. - 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.
Responsible entity	The proponent, construction contractor, hydrological specialist contractor and environmental superintendent.
Evaluation of the Effectiveness of Measures	Sediment and erosion control measures are to be in accordance with ICC requirements. The mitigation measures are therefore considered effective in minimising and mitigating risk of disturbance from erosion and sedimentation to threatened fauna species during construction, and allow for adaptive management and corrective actions where required. In addition, the extensive rehabilitation of the environmental network will reduce potential impacts from erosion and sediment with appropriate rehabilitation and erosion control techniques.
Risk assessment	Low. The implementation of mitigation measures reduce the risk of impacts from moderate to low.
Performance Criteria Milestone	Erosion and Sediment Control methods are implemented during earthworks. RMPs implemented.
Timeline	Throughout construction
Residual Impact	No. Significant residual impact not expected as a result of the activity.
Risk 4 : Construction activities increase the risk of weeds, pathogens and contamination into the referral area.	
Pre-mitigation Risk Assessment	**Moderate.** As detailed in **Section 4.6** Direct, Indirect and Cumulative Impacts, weed species currently exist on-site. Machinery used for construction has the potential to spread weeds or introduce however standard mitigation measures will be enacted to minimised this risk.
Avoidance and Mitigation Measures	Due to the high levels of modification on-site, the site already contains weeds species. To manage potential impacts, weed and pathogen management procedures will be included within the VCFMP. Weeds will be actively managed within the construction footprint and vehicle access points, 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 where necessary.

Construction Phase - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered	
Responsible entity	The proponent, civil contractor, environmental superintendent.
Evaluation of the Effectiveness of Measures	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 implemented as part of the VCFMP are best practice and in accordance with standard procedures and guidelines.
Risk assessment	**Low.** These measures are considered effective in avoiding, minimising and mitigating risks of contamination, weeds and pathogens to MNES values, reducing the risk from moderate to low.
Performance Criteria Milestone	**All vegetation clearing is limited to the areas approved under the EPBC Act and Economic Development Act. The VCFMP does not permit dogs on-site and nominates weed and pathogen management procedures.**
Timeline	Throughout construction.
Residual Impact	**No.** Significant residual impact not expected as a result of the activity.
OPERATION PHASE	
Risk 5: Waterway crossings prevents or hinders flora dispersal throughout the wide waterway corridor and TEC patch.	
Pre-mitigation Risk Assessment	**Moderate.** The dissection of waterway crossings across the waterway corridor, where designed inappropriately, can result in fragmentation of existing habitat values.
Avoidance and Mitigation Measures	This area will be rehabilitated post construction, and will support safe fauna movement beneath the bridge/waterway crossings. Directional fencing to be installed to funnel fauna away from the road and underneath the bridge, where necessary. Limit to one crossing over.
Responsible entity	The proponent, civil engineer contractor, landscape architect, environmental superintendent.
Evaluation of the Effectiveness of Measures	The incorporation of revegetation and rehabilitation proposed in areas within, along with one bridge crossing designed to allow fauna movement, significantly reduce this risk.
Risk assessment	**Low.** The retention and rehabilitation of the environmental network will provide safer connectivity value than the existing, highly modified subject site. Highly mobile fauna (i.e. birds) are not considered to be impacted by the creation of physical barriers created through the development of the referral area.
Performance Criteria Milestone	Implement VCFMP and construct bridge in accordance with the CEMP.
Timeline	**Operation Phase**

Construction Phase - Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Endangered	
Residual Impact	No. Ongoing significant residual impact not expected as a result of the activity.

6. Proposed Offsets

As stated in Item 6 of the PD RFI, ***'Where residual significant impacts to listed threatened species or ecological communities remain after application of all reasonable avoidance and mitigation measures, a compensatory environmental offset in accordance with the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (EPBC Offsets Policy) is required'***.

In accordance with the EPBC Act Offsets Policy, PEET, EDQ and DCCEEW will work together to ensure a suitable offset and Offset Management Plan are agreed before the approval decision. The offset area once finalised will allow for conservation gains for the impacted species including like for like habitat recreation for identified feature-based impacts.

Where residual significant impacts to listed threatened species or ecological communities remain as identified within this preliminary documentation, a compensatory environmental offset in accordance with the Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy (EPBC Offsets Policy) will be provided.

7. Economic and Social Matters

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

- ***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.***
- ***Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.***
- ***Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.***
- ***Provide details of any consultation with Indigenous stakeholders.***
- ***Indigenous engagement***

Identify existing or potential native title rights and interests, including any areas and objects that are of particular significance to Indigenous peoples and communities, possibly impacted by the proposed action and the potential for managing those impacts.

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***
- ***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.

7.1.Social and Economic costs and/or benefits

Urbis was appointed by Peet Flagstone PTY LTD to undertake an independent high-level review of the direct and indirect opportunities linked to the upgrades and construction of a northern connection road for their landholdings in the Flagstone PDA. The proposed road upgrade will extend from the Northern Boundary of the Peet Landholdings in the Flagstone PDA connecting to the Springfield Greenbank Arterial road and provide ultimate accessibility to the Centenary Highway. The Flagstone New Beith Road Connection, Economic Memorandum is provided in **Appendix A5**.

The development opportunity created by the road will consist of a mix of land-uses including residential of various typologies and densities including apartments. Provision is made for a town centre which will contain office and retail uses, other local centres, community services (including education and health care) and employment land (Light Industry and MIBA) in excess of 600,000 GFA. Accessibility is highlighted throughout the opportunity assessment as a key enabling factor and an access road would play a catalytic role in enabling opportunities to realise across all land-uses. The aspiration of heavy vehicle access is noted to allow for ultimate utilisation and broad market appeal to mixed business and industry occupiers. Activation of business uses will serve an important employment driver and allow for improved self-containment.

A large range of approvals surround the Site and rely on the Proposed Action gaining approval for access and commencement of construction. A timely approval process will ensure costs are minimised and land will be available for residential use.

The road construction will deliver a direct benefit 83 FTE jobs and $10.6 million during construction. The catalytic benefit of the road has the potential to unlock more than $4,100 million expenditure impact and 37,000 jobs during the construction phase for ultimate development build out. Sustained operational benefits includes approximately $2,200 million GSP contribution and 27,000 permanent jobs, subject to accessibility constrains being resolved as outlined in more detail within **Appendix A5**.

Flagstone has various strengths and opportunities, but most are tied to improving accessibility to realise these benefits. Weaknesses and threats including the mitigation of negative distance from main centres and the Brisbane CBD distance perceptions all relate to accessibility and the need for advantageous road connections. The proposed road connection as such can address many of the negative factors and strengthen the positives within the region. Interaction with local agents confirmed the importance of accessibility to generate population growth momentum, drive amenity and improve the marketability of the precinct for employment land uses.

The infrastructure delivery of the entire section of road extending from the northern boundary of the Peet Land holdings to connect to the Springfield Greenbank arterial is key in the realisation of the development vision for Flagstone. The enabling infrastructure will serve an important purpose to drive employment, position the development as a key centre for Brisbane's South West Corridor and fostering a community of growth opportunities where businesses can grow and prosper.

7.2. Stakeholder Engagement

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

Engagement and support for The Proposed Impact is also shown in **Attachment A3** from Queensland Government, Economic Development Queensland within Department of State Development, Infrastructure, Local Government and Planning. The department has been engaged from early stages and supports all necessary works, subject to appropriate approvals in place, to enable the construction of this road at the earliest timeframe.

7.3. Indigenous Engagement

With regards to indigenous engagement, the site is an existing road reserve with a rural standard road. There are no registered or known Cultural Heritage issues associated within the road reserve. Any potential Cultural Heritage issues will be addressed under the EDQ approvals.

8. Ecological Sustainable Development

Item 9 of the of the PD RFI requests ***'A description of how the proposed action meets the principles of ESD, as defined in section 3A of the EPBC Act. The following are the principles of ecologically sustainable development:***

- ***a) decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations;***
- ***b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;***
- ***c) the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;***
- d) ***the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making***

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

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;
3. to protect biological diversity and maintain essential ecological processes and life-support systems;

Table A73 assesses the capacity for this project to meet the principles of ESD, as defined in section 3A of the EPBC Act.

Table A73: Core Objectives and Principles of ESD defined under EPBC Act Section 3A

Core objectives of ecologically sustainable development defined under Section 3A of the EPBC Act

A. **Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations.**

The design of the project has taken both long-term and short-term economic, environmental, social and equitable considerations into account. The proposed action is integral and high priority transport infrastructure within GFUDA, helping to ensure the sustainable and equitable development of the New Beith locality.

As shown in **Figure A3**, the road is identified on Map 2 Vision of the GFUDADS as a regional road for the transport network mapping. The proposed road links district and neighbourhood centres and forms the main access point for future 'Urban Living' land use zones of the planning scheme.

The project will enhance equitable local access to services for the local community, and support and service efficient and sustainable land use patterns. Additionally, the project will enable the state government to better respond to the current and projected demand for employment and business services, while also ensuring a well-planned residential community.

The development will contribute to the efficient and integrated movement networks planned for within the GFUDADS, accommodating a range of users and public transport, functioning as the major road. The road hierarchy included in strategic mapping for GFUDADS, provides access routes to neighbourhoods minimising traffic impacts on residential areas.

The project will benefit individuals and the community by providing efficient, sustainable and effective movement network, functioning as a hierarchy for multiple access to and through planned neighbourhoods helping to minimise impact on residential areas. Ultimately the provision of a regional road on a parcel of land currently containing a vehicle track and previously cleared, reduces the project's environmental impact on areas with higher environmental significance with no preexisting clearing therefore supporting long-term environmental considerations.

The proposed action has been designed to provide transport infrastructure while also providing visual amenity sensitive to the local environment. Ecological values both within and adjacent the referral area, have been taken into account during the design of the proposed action. Reviewing the above, the project will safeguard the needs of future generations helping to provide the orderly and efficient provision of future roads in GFPDA.

The proposed road linkage is essential for future development in the region and needs to be undertaken in initial stages for provision of access for future development. Vegetation retention will be subject to detailed design and engineering, however as the project is for road network, conservation zones are not proposed. It is expected direct impact will occur to the road, batters and a 5m buffer from batter extent. While the referral area is quite large and includes a buffer of 100m the direct impact area is relatively small in comparison.

As a summary, the proposed scope of works involves the delivery of a new regional road, that involves the following:

- Essential linkages to proposed centres and residential development.
- Provision of public transport network to service the business and residential needs in the future.
- Orderly and sustainable road networks, planned and designed in accordance with the overarching strategic planning of GFUDA.
- Movement networks that support and enhance public transport within the region.
- Provision of multiple access points to neighbours and centres, avoiding additional traffic to residential area
- Supporting the GFUDA as a growth corridor for significant future growth for residential and employment opportunities.
- Utilisation of existing tracks and cleared/modified land for the use of regional road network rather than clearing higher ecologically significant land.

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

The implementation of precautionary measures in decision making is used where there is a threat of serious or irreversible harm and where there is scientific uncertainty as to the extent of possible environmental damage. There are a number of factors which help determine whether 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.

The referral area has been subject to comprehensive environmental surveys and reporting. The ecological values of the referral area have been identified and recorded within this report. The referral area is comprised of a mix of vegetation communities as shown in **Plan A4** including remnant vegetation subject to moderate disturbance from onsite and surrounding land uses. Impacts to these MNES values are minimised by the design of the designation of future land use precincts and reducing disturbances.

The proposed action has sought to avoid, minimise and mitigate impacts to ecological processes. This has been achieved through the design of the road network on a minimal development footprint while utilising an existing unsealed road/track rather than selection of land containing higher ecological significance (**Plan A1**).

Impacts to fauna and associated habitat have been identified as the primary environmental concern on a level of National Environmental Significance. The impact site's utilisation by fauna and its ability to provide critical habitat for listed species has been discussed in detail throughout this report.

Several potential impacts because of the project have been identified and includes 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 and include;

Impacts discussed in Ecological Assessment – Matters of National Environmental Significance include;

- Vegetation clearing;
- Habitat loss
- Weeds
- Vehicle movement and strike
- Earthworks
- Light emissions during construction
- Noise and vibration
- Waste disposal
- Hazardous and dangerous goods
- Increased human presence

Avoidance, mitigation and management measures include

- Site selection and location
- Use of previously cleared and modified land
- Vegetation Clearing and Fauna Management Plan (VCFMP)
- Fauna Spotter Catcher
- Integration of fauna friendly infrastructure

The impacts from the project have been identified and management measures have been subsequently developed. All impacts are considered to be localised impacts. The magnitude of impact is small and restricted to the referral site and immediately adjoining areas. Impacts can be summarised as those arising from the loss of habitat, barriers to movement, injury or death from vehicle strike or dog attack and dispersal into residential areas.

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

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

The proposed action will safeguard the needs of future generations while meeting the demands of current generations. Measures will be implemented to avoid and mitigate potential impacts (refer **Section 5.2**). Offsets in accordance with DCCEEW's *EPBC Act Environmental Offsets Policy (2012)* will be provided to account for residual impacts on MNES.

The development has considered the diverse future needs of the community and will deliver transport infrastructure through the construction of a regional road. Essentially this road will support growth and the economy, connecting and creating an accessible region. Further, the road will support and enable the Queensland Government, Department of Transport and Main Roads, alongside LCC in providing equitable and accessible public transport services connecting the UDA to existing and future education, health and retails centres in the region.

The provision of a well-designed and planned transport network ensures visual amenity is protected and maintained in future development, diverting higher order traffic away from residential communities. Well-designed regional roads reduce the need for further lower order roads, helping to ensure inter-generational equity for health, diversity and productively of the environment, efficiently utilising the land, and protecting areas of higher ecological significance for future generations.

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

The proposed action supports the GFUDA and wider economy through the provision of essential services including future housing, centres and economy, transport networks, and healthcare services. The relationship between economic development and environmental protection has been continuously identified in 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 allow 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 and planning for this environmental conservation is best undertaken during approval stage. The project presents an opportunity to facilitate safe fauna connectivity linking habitat corridors east/west, via fauna movement infrastructure. The proposal has incorporated environmental protection through site selection on previously cleared and modified land, and also through the design of the proposed action to ensure minimal impact to environmentally significant species.

This project has considered best practice, and relevant guidelines and policies. To account for significant residual impact to MNES values, an offset will be provided in accordance with the EPBC Act Offsets Policy to provide the cost-effective analysis of proposed offsets (see Section 6 of this report).

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

Item 10 of the of the PD RFI requests *'details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:*

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

In response to requested Item 10 The Proponent has advised there are no past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against the person proposing to take the action.

10. Conclusion

SHG were commissioned to develop Preliminary Documentation to support assessment of the proposed action on behalf of the Proponent to DEECCW for the Proposed Action. The CAR was lodged in regard to proposed new road at New Beith Road, Flagstone (the Proposed Action).

The Proposed Action is to clear vegetation, conduct earthworks and install associated infrastructure to upgrade and widen 3.2 km of New Beith Road, Flagstone, Queensland. The Proposed Action was deemed a Controlled Action and therefore required further assessment and approval under the EPBC Act before proceeding. The relevant controlling provisions include;

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

This PD Report provides information requested by the DEECCW to assist the assessment manager in determining whether or not the development will be approved. Impact to listed threatened species and communities has been minimised through utilisation of the mitigation hierarchy to minimise the amount of impact and ultimately damage the action will have on the environment. The steps have been followed and form an integrated approach to site selection through to mitigation and management measures. The mitigation hierarchy of; 1. Avoid, 2. Mitigate, and 3. Offset have been followed for the development to minimise potential impacts to MNES and their habitat. The overarching strategy to utilise an existing cleared and modified road reserve for the Proposed Action has resulted in minimal impact on protected matters while providing the road network infrastructure required for the growing population within the region.

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